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ΤΜΗΜΑ ΜΗΧΑΝΙΚΩΝ ΠΛΗΡΟΦΟΡΙΚΗΣ ΤΕ



**Κατασκευή πακέτου προσομοίωσης σε Matlab
εργαστηριακών ασκήσεων του εργαστηρίου
Ηλεκτρικών Κυκλωμάτων σε σχέση με το ισοδύναμο
κύκλωμα Thevenin**

Πτυχιακή εργασία του

Λεμονή Χρήστου (1095)

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1.Τίτλος Πτυχιακής Εργασίας

Κατασκευή πακέτου προσομοίωσης σε Matlab εργαστηριακών ασκήσεων του εργαστηρίου Ηλεκτρικών Κυκλωμάτων σε σχέση με το ισοδύναμο κύκλωμα Thevenin

2.Σύντομη περιγραφή Πτυχιακής Εργασίας

Η εργασία αυτή αφορά την ανάπτυξη κώδικα σε Matlab για την προσομοίωση ηλεκτρικών κυκλωμάτων του εργαστηρίου Ηλεκτρικών Κυκλωμάτων και την εύρεση του ισοδύναμου τους κατά Thevenin. Έχει γίνει λεπτομερής επίλυση αρκετών ηλεκτρικών κυκλωμάτων βρίσκοντας το ισοδύναμο τους κατά Thevenin. Όλα τα βήματα στην διαδικασία της επίλυσης προσομοιώθηκαν μέσω κώδικα στο Matlab, με αποτέλεσμα να είναι σε μορφή κατάλληλη για παρουσίαση-διδασκαλία σαν εικονικά-ηλεκτρονικά εργαστήρια εκμάθησης και διδασκαλίας.

3.Matlab

Για την πραγμάτωση της πτυχιακής εργασίας βασικό εργαλείο που θα χρησιμοποιήσαμε είναι το Matlab. Το Matlab είναι μια υψηλού επιπέδου γλώσσα τεχνικού προγραμματισμού και ένα αλληλεπιδραστικό περιβάλλον για την ανάλυση στοιχείων και την ανάπτυξη αλγορίθμων και εφαρμογών. Το Matlab είναι από τα δημοφιλέστερα

προγραμματιστικά πακέτα στην ακαδημαϊκή κοινότητα, παρουσιάζει μεγάλο ενδιαφέρον για φοιτητές, σπουδαστές, καθηγητές, ερευνητές ανωτάτων ιδρυμάτων, επιστήμονες διαφόρων ειδικοτήτων, επαγγελματίες, μηχανικούς, τεχνικούς και ένα πλήθος ανθρώπων που ασχολούνται με εξειδικευμένους τομείς της τεχνολογίας. Χρησιμοποιείται κατά κύριο λόγο για την επίλυση μαθηματικών προβλημάτων, ωστόσο έχει ανέπτυχθει πολύ με αποτέλεσμα να γίνει ένα ισχυρότατο εργαλείο στην οπτικοποίηση, στον προγραμματισμό, στην έρευνα, στην επιστήμη των μηχανικών και στις επικοινωνίες. Το Matlab περιέχει εντολές από την C++ όπως while, switch και if. Στον τομέα των γραφικών μπορεί να υπολοιήσει συναρτήσεις πραγματικές, μιγαδικές, πεπλεγμένες συναρτήσεις δύο μεταβλητών και άλλες. Τέλος να αναφέρουμε ότι το Matlab είναι διαθέσιμο για όλα τα λειτουργικά συστήματα (Windows, Linux, Solaris, MAC) που χρησιμοποιούνται.

4.Πράξεις στο Matlab

Το Matlab όπως και κάθε πρόγραμμα, για την εκτέλεση μαθηματικών πράξεων χρησιμοποιεί τους τελεστές πράξης οι οποίοι είναι:

- + για την πράξη της πρόσθεσης
- για την πράξη της αφαίρεσης
- * για την πράξη του πολλαπλασιασμού
- / για την πράξη της διαίρεσης

Πέρα όμως από τους βασικούς τελεστές έχουμε και άλλους όπως:

- ^ δύναμη

Sqrt(x)	τετραγωνική ρίζα
Sin(x)	ημίτονο
Cos(x)	συνημίτονο
Tan(x)	εφαπτομένη
Acos(x)	τόξο συνημιτόνου x από 0 έως π
Asin(x)	τόξο ημιτόνου x από $\pi/2$ έως $-\pi/2$
Atan(x)	τόξο εφαπτομένης x από $\pi/2$ έως $-\pi/2$

5.Οι μεταβλητές στο Matlab

Πολλές φορές είναι αναγκαίο να δηλώνουμε τις τιμές σε μεταβλητές και να εκτελούμε πράξεις χρησιμοποιώντας τις μεταβλητές και όχι απευθείας την τιμή τους. Αυτό βοηθά να χρησιμοποιούμε την τιμή (που μπορεί να είναι και το αποτέλεσμα μίας άλλης πράξης ή για παράδειγμα το ημίτονο μίας γωνίας) που αντιπροσωπεύει η μεταβλητή σε πολλές πράξεις και να μην την δηλώνουμε συνέχεια αφού το Matlab, μέχρι να κάνουμε νέα καταχώρηση στη μεταβλητή, κρατά την τιμή της. Οι μεταβλητές δεν πρέπει να συμπίπτουν με σταθερές ή μεταβλητές ή συναρτήσεις του Matlab. Προσοχή επίσης θέλει στις μεταβλητές δηλαδή το A και το a να είναι διαφορετικές. Κάθε μεταβλητή μπορεί να έχει μία μόνο τιμή. Αν οριστεί μία νέα τιμή για την ίδια μεταβλητή η προηγούμενη τιμή χάνεται.

6.Βασικοί τρόποι εισαγωγής δεδομένων στο Matlab

-Στον editor του προγράμματος σε περιπτώσεις που έχουμε να διαχειριστούμε πράξεις με λίγες γραμμές κώδικα.

-Στον Blank M-File editor του Matlab όπου μας δίνεται η δυνατότητα να δημιουργήσουμε από απλές σειρές εντολών μέχρι και κώδικα προγραμματισμού.

Και οι δύο τρόποι είναι εξίσου λειτουργικοί και έγκειται στον χρήστη κάθε φορά να αποφασίζει για το ποιος τρόπος είναι καλύτερος να χρησιμοποιηθεί σε κάθε περίπτωση.

7. Matlab στον Blank M-File editor

Το Matlab μας δίνει την δυνατότητα βρόχων επαναλήψεως με εντολές όπως την for και ελέγχου ροής χρησιμοποιώντας εντολές όπως if και while εντολές τις οποίες χρησιμοποιούν οι γλώσσες προγραμματισμού C και basic

8. Προγραμματισμός μιας συνάρτησης στο Matlab

Πολλές φορές είναι απαραίτητο να χρησιμοποιούμε πράξεις ή συναρτήσεις οι οποίες μπορεί να επαναλαμβάνονται αρκετές φορές στην ίδια εργασία ή και σε διαφορετικές εργασίες. Το Matlab μας δίνει την δυνατότητα να προγραμματίσουμε συναρτήσεις τις οποίες μπορούμε έπειτα να τις χρησιμοποιήσουμε εισάγοντας μόνο δεδομένα. Οι

προγραμματισμένες συναρτήσεις είναι τύπου M-file με τη διαφορά ότι ξεκινάμε με τη δήλωση function.

9.Δομές στο Matlab

Στο Matlab έχουμε την δυνατότητα να δημιουργήσουμε δικούς μας τύπους δεδομένων προσαρμοσμένους στις ανάγκες του εκάστοτε προγράμματος. Οι δομές δημιουργούνται με μεγάλη ευκολία στο Matlab με την χρήση της εντολής `struct()` η οποία παίρνει ως ορίσματα το όνομα του πεδίου και δίπλα την τιμή του πεδίου. Τα ορίσματα αυτά μπορεί να είναι πολλαπλά ανάλογα με τα πεδία που έχουμε σε κάθε δομή. Ως συνήθως για την συμπλήρωση στοιχείων σε δομές χρησιμοποιούνται βρόχοι `while`,`for` κτλ.

10.Ανεξάρτητη πηγή τάσης

Όταν λέμε πηγή τάσης εννοούμε ένα στοιχείο κυκλώματος στο οποίο η διαφορά δυναμικού στα άκρα του , που εκφράζεται ως $v(t)$, είναι ανεξάρτητη από το ρεύμα που το διαρρέει. Με λίγα λόγια ανεξάρτητη πηγή τάσης μπορεί να θεωρηθεί ένα στοιχείο του οποίου η διαφορά δυναμικού στα άκρα του , σε οποιαδήποτε χρονική στιγμή, είναι ανεξάρτητη του ρεύματος που διαρρέει τον κλάδο της πηγής.

11.Ανεξάρτητη πηγή ρεύματος

Με τον όρο ανεξάρτητη πηγή ρεύματος εννοούμε ότι η τιμή της πηγής ρεύματος στο κύκλωμα είναι ανεξάρτητη από την διαφορά δυναμικού στα άκρα της. Σε αυτό το σημείο να σημειώσουμε ότι στην φύση δεν υπάρχει ανεξάρτητη πηγή ρεύματος αλλά ούτε και τάσης. Απλά ορισμένα στοιχεία με ορισμένες προϋποθέσεις μπορεί να θεωρηθούν ότι προσεγγίζουν την συμπεριφορά των ιδανικών πηγών.

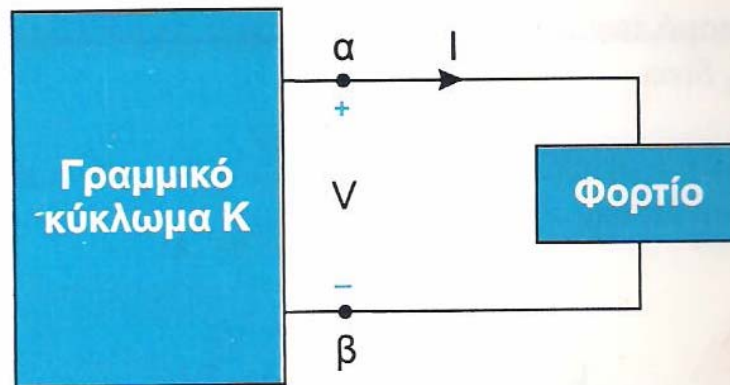
12.Το θεώρημα της Υπέρθεσης

‘Όλα τα κυκλώματα που θα μελετήσουμε, είναι γραμμικά και χρονικά αμετάβλητα. Βασική ιδιότητα τέτοιων κυκλωμάτων είναι η ιδιότητα της υπέρθεσης. Το Θεώρημα της υπέρθεσης σημαίνει ότι η απόκριση σε ένα σημείο ενός κυκλώματος που έχει περισσότερες από μία ανεξάρτητες πηγές, είτε πρόκειται για ρεύμα, είτε για τάση μπορεί να προκύψει από το άθροισμα των αποκρίσεων που καθεμιά από τις ανεξάρτητες πηγές δίνει στο σημείο αυτό. Με λίγα λόγια, για να βρούμε την απόκριση σε ένα σημείο γραμμικού κυκλώματος, υπολογίζουμε διαδοχικά την απόκριση που προκύπτει από την εφαρμογή κάθε φορά μιας μόνο από τις ανεξάρτητες πηγές ενώ οι υπόλοιπες θεωρούνται μηδενικές. Η ολική απόκριση θα ισούται με το αλγεβρικό άθροισμα των επιμέρους αποκρίσεων. Να σημειώσουμε ότι, όταν λέμε ότι μηδενίζουμε τις ανεξάρτητες πηγές, αυτό σημαίνει ότι βραχυκυκλώνονται οι πηγές τάσης και ανοιχτοκυκλώνονται οι κλάδοι που περιέχουν τις πηγές ρεύματος.

13.Το θεώρημα Thevenin

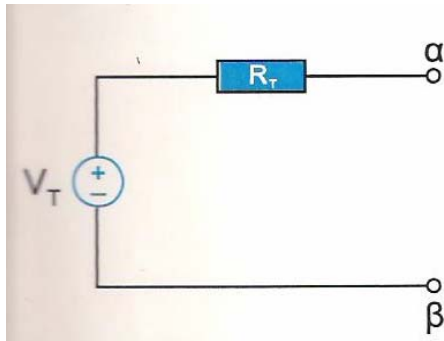
Έχοντας κατανοήσει το θεώρημα της υπέρθεσης, μπορούμε να αναπτύξουμε , 2 από τα σπουδαιότερα θεωρήματα απλοποίησης κυκλωμάτων. Το πρώτο με το οποίο ασχολούμαστε κατά κύριο λόγο σε αυτήν την πτυχιακή είναι το θεώρημα Thevenin. Το θεώρημα Thevenin πήρε το όνομα του Γάλλου Λέο Σαρλ Τεβένι , που ήταν μηχανικός και εργαζόταν στον τηλεγράφο. Αυτός ήταν ο πρώτος που το δημοσίευσε το 1883. Το θεώρημα Thevenin αποτελεί ένα ισχυρό εργαλείο για τον γρήγορο υπολογισμό της απόκρισης σύνθετων κυκλωμάτων. Η σπουδαιότητα του θεωρήματος προκύπτει από το ότι είναι σε θέση να μας δώσει το ισοδύναμο των κυκλωμάτων από οποιοδήποτε ζεύγος ακροδεκτών του. Ένα οποιοδήποτε γραμμικό κύκλωμα αν ειδωθεί από ένα ζεύγος ακροδεκτών α και β τότε διαχωρίζεται σε 2 τμήματα. Το πρώτο τμήμα αποτελείται από το φορτίο από τους ακροδέκτες α και β ενώ το δεύτερο αποτελείται από το υπόλοιπο του αρχικού κυκλώματος. Για τα κυκλώματα αυτά γίνονται οι εξής υποθέσεις.

- ο Τα στοιχεία του γραμμικού κυκλώματος μπορεί να έχουν αρχικές συνθήκες.
- ο Το γραμμικό κύκλωμα μπορεί να περιέχει εξαρτημένες και ανεξάρτητες πηγές
- ο Δεν υπάρχει μαγνητική σύζευξη μεταξύ των δύο κυκλωμάτων
- ο Τα στοιχεία του φορτίου μπορεί να είναι γραμμικά ή μη γραμμικά, χρονικά ή μη χρονικά μεταβαλλόμενα, κάτι που σημαίνει ότι δεν απαιτείται καμία προϋπόθεση για το φορτίο

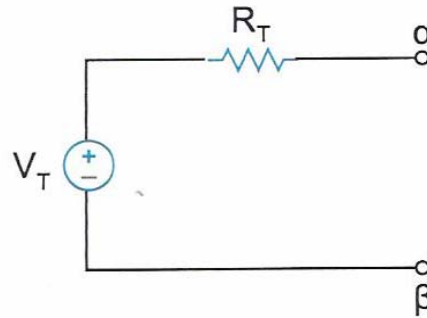


ΣΧΗΜΑ 1

Από τα παραπάνω προκύπτει ότι η μόνη επικοινωνία ανάμεσα στα δύο κυκλώματα, γίνεται με το ρεύμα I που κυκλοφορεί ανάμεσα τους. Με αυτές τις προϋποθέσεις το θεώρημα Thevenin καθορίζει ότι η σχέση ανάμεσα στο ρεύμα I και την τάση V δεν θα αλλάξει αν το γραμμικό κύκλωμα αντικατασταθεί με το ισοδύναμο του κατά Thevenin. Οπότε όταν σε ένα κύκλωμα το ενδιαφέρον συγκεντρώνεται μόνο σε ένα τμήμα του, το υπόλοιπο μπορεί να αντικατασταθεί με το ισοδύναμο του κατά Thevenin. Με αυτό τον τρόπο μπορούμε να αντικαταστήσουμε ένα μεγάλο τμήμα ενός κυκλώματος με ένα πολύ απλό ισοδύναμο κύκλωμα το οποίο και θα μπορούμε εύκολα να αναλύσουμε και να υπολογίσουμε την τάση, το ρεύμα και την ισχύ που το αρχικό κύκλωμα μεταφέρει στο φορτίο. Το ισοδύναμο κατά Thevenin κύκλωμα παρουσιάζεται στο σχήμα 2(α) όπου η τάση V_T ισούται με την τάση ανοιχτοκυκλώσεως του γραμμικού κυκλώματος K του σχήματος 1, ενώ η αντίσταση Thevenin R_T προκύπτει από το κύκλωμα K αν μηδενιστούν όλες οι ανεξάρτητες πηγές του και τεθούν οι αρχικές συνθήκες του ίσες με μηδέν. Με τον όρο μηδενισμό των ανεξάρτητων πηγών εννοούμε το βραχυκύκλωμα των πηγών τάσης και το ανοιχτοκύκλωμα των κλάδων που περιέχουν τις πηγές ρεύματος. Να σημειώσουμε ότι για να βρούμε την αντίσταση R_T δεν μηδενίζονται οι εξαρτημένες πηγές του κυκλώματος K . Σε περίπτωση που το κύκλωμα K είναι ωμικό κύκλωμα, τότε το R_T μπορεί να αντιστοιχηθεί με μια απλή ωμική αντίσταση. Το ισοδύναμο κατά Thevenin φαίνεται στο σχήμα 2(β)



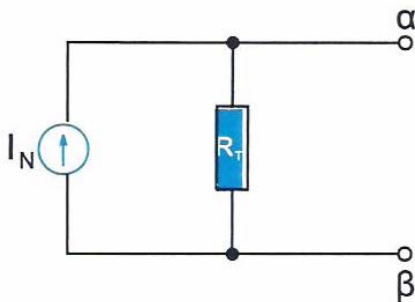
ΣΧΗΜΑ 2(α)



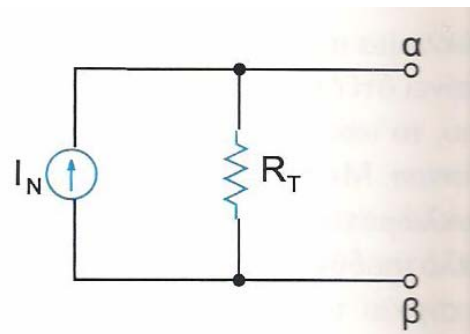
ΣΧΗΜΑ 2(β)

14. Το Θεώρημα Norton

Το θεώρημα Norton είναι το δυικό του θεωρήματος Thevenin και προκύπτει εύκολα από αυτό. Φέρει το όνομα του E.L.Norton, ενός μηχανικού που εργαζόταν για την Bell Telephone Laboratories. Είναι και αυτό θεώρημα απλοποίησης κυκλωμάτων. Όπως και το θεώρημα Thevenin αποτελεί εργαλείο υπολογισμού της απόκρισης σύνθετων κυκλωμάτων.



ΣΧΗΜΑ 3(α)

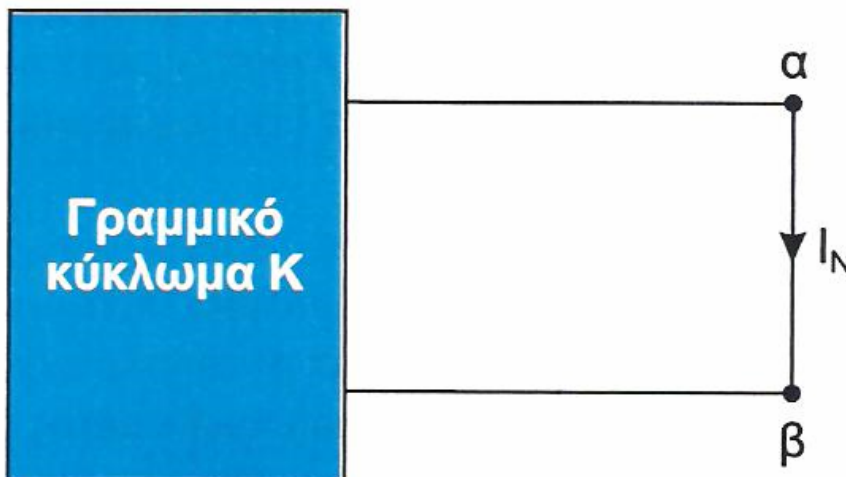


ΣΧΗΜΑ 3(β)

Στο σχήμα 3(α), δίνεται το ισοδύναμο κατά Norton του γραμμικού κυκλώματος Κ. Σε αυτή την περίπτωση η R_T είναι ίδια με αυτή του ισοδύναμου κατα Thevenin κυκλώματος και προσδιορίζεται με τον ίδιο τρόπο όπως και στην περίπτωση του θεωρήματος Thevenin. Το ρεύμα I_N είναι ίσο με το ρεύμα βραχυκυκλώσεως του κυκλώματος Κ. Οπότε ισούται με το ρεύμα που διαρρέει τον κλάδο α-β, αν οι ακροδέκτες α και β βραχυκυκλωθούν. Αυτό φαίνεται και στο σχήμα 4. Σε περίπτωση που το αρχικό κύκλωμα Κ είναι ωμικό τότε το ισοδύναμο κύκλωμα κατά Norton είναι αυτό που φαίνεται στο σχήμα 3(β). Η σχέση που συνδέει τα ισοδύναμα κατά Thevenin και Norton σε περίπτωση ωμικών κυκλωμάτων είναι η παρακάτω.

$$V_T = R_T * I_N$$

και αυτό εξηγεί την δυικότητα των δύο ισοδύναμων κυκλωμάτων



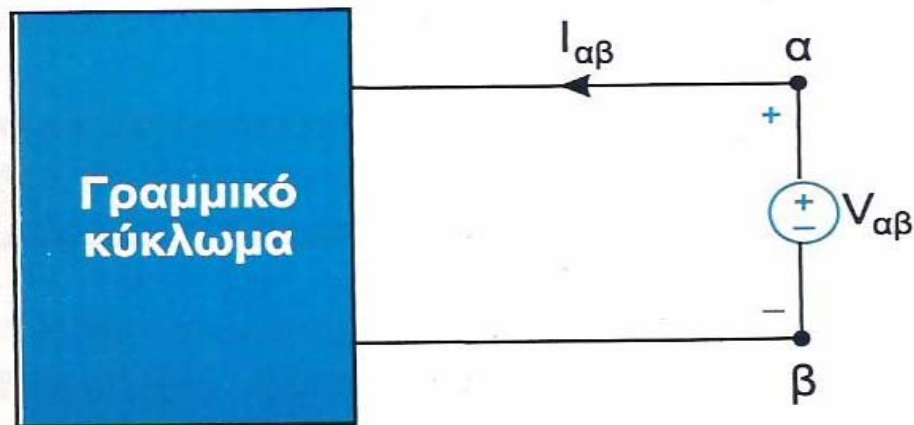
ΣΧΗΜΑ 4

15.Υπολογισμός ισοδύναμων κυκλωμάτων κατά Thevenin

Σε αυτό το σημείο θα δοθούν οι μεθοδολογίες εύρεσης των ισοδύναμων κυκλωμάτων κατά Thevenin. Για τον υπολογισμό των ισοδύναμων κυκλωμάτων Thevenin αρκεί να προσδιορίσουμε δύο από τις τρεις μεταβλητές V_T , I_N και R_T και αυτό γιατί η τρίτη μπορεί να υπολογιστεί από την εξίσωση $V_T=R_T \cdot I_N$. Για τον υπολογισμό των V_T και I_N ακολουθούμε την ίδια διαδικασία είτε πρόκειται για κύκλωμα με εξαρτημένες πηγές είτε όχι. Για τον υπολογισμό της R_T υπάρχει μια γενική μέθοδος προσδιορισμού και μια ειδικότερη για την περίπτωση που το κύκλωμα δεν περιέχει εξαρτημένες πηγές. Ο υπολογισμός της V_T γίνεται με την χρησιμοποίηση των γνωστών μεθόδων ανάλυσης ηλεκτρικών κυκλωμάτων (μέθοδος κόμβων, μέθοδος βρόχων κλπ.) και χωρίς να γίνει καμιά αλλαγή στο κύκλωμα. Η V_T είναι ίση με την τάση ανοιχτοκυκλώσεως, δηλαδή, με τη διαφορά δυναμικού στους δύο ακροδέκτες όταν δεν υπάρχει συνδεδεμένο φορτίο σε αυτούς. Στο σχήμα 5(α) φαίνεται το κύκλωμα υπολογισμού και η πολικότητα της V_T .



(α)



(β)

ΣΧΗΜΑ 5(α)(β)

Για το ρεύμα βραχυκύκλωσης και τον τρόπο υπολογισμού του ισχύει ότι όπως φαίνεται και στο σχήμα 4 το ρεύμα I_N είναι το ρεύμα που διαρρέει τον κλάδο α-β όταν τα σημεία α και β βραχυκυκλωθούν. Και εδώ το αρχικό κύκλωμα δεν μεταβάλλεται ενώ ο προσδιορισμός του I_N γίνεται με την εφαρμογή των γνωστών μεθόδων ανάλυσης των κυκλωμάτων. Για τον υπολογισμό της R_T ακολουθούμε τα παρακάτω βήματα

- Μηδενίζουμε όλες τις αρχικές συνθήκες του κυκλώματος, δηλαδή, για τους πυκνωτές $v_c(0)=0$ και για τα πηνία $i_L(0)=0$.
- Απομακρύνουμε από το κύκλωμα όλες τις ανεξάρτητες πηγές κάτι που σημαίνει ότι οι πηγές τάσης βραχυκυκλώνονται και οι πηγές ρεύματος ανοιχτοκυκλώνονται. Οι εξαρτημένες πηγές εξακολουθούν να λειτουργούν όπως στο αρχικό κύκλωμα.
- Κάτω από τις συνθήκες αυτές υπολογίζουμε την αντίσταση R_T στους ακροδέκτες α-β. Αν το κύκλωμα δεν έχει εξαρτημένες πηγές, τότε η R_T μπορεί να υπολογιστεί με απλή σύνθεση των επιμέρους στοιχείων του κυκλώματος. Αν όμως έχουμε εξαρτημένες πηγές, τότε η R_T μπορεί να γίνει με τον τρόπο που φαίνεται στο σχήμα 5(β). Συγκεκριμένα μεταξύ των ακροδεκτών α-β εφαρμόζουμε μια γνωστή πηγή τάσης $V_{αβ}$ και στην συνέχεια υπολογίζουμε το ρεύμα $I_{αβ}$ με τη φορά που φαίνεται στο σχήμα 5(β)

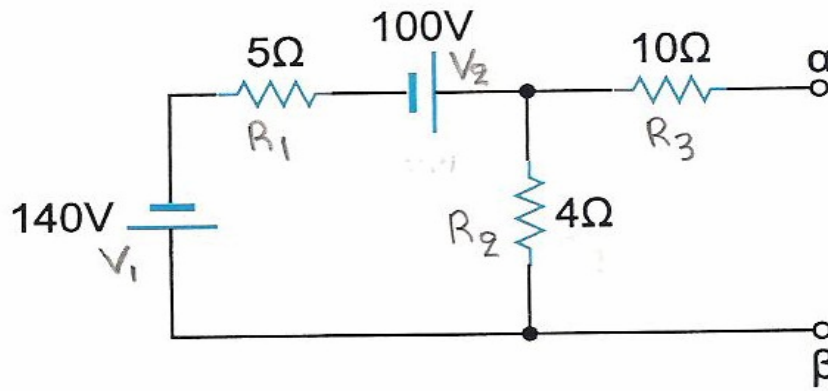
$$\text{Η } R_T \text{ ισούται με } R_T = V_{αβ} / I_{αβ}.$$

Το ίδιο θα είναι το αποτέλεσμα αν αντί για μια γνωστή τάση $V_{αβ}$ θεωρήσουμε ότι μεταξύ των ακροδεκτών α-β εφαρμόζεται μια γνωστή πηγή ρεύματος $I_{αβ}$ και κατόπιν υπολογίσουμε την τάση $V_{αβ}$.

16. Παράδειγμα λύσης Άσκησης 1

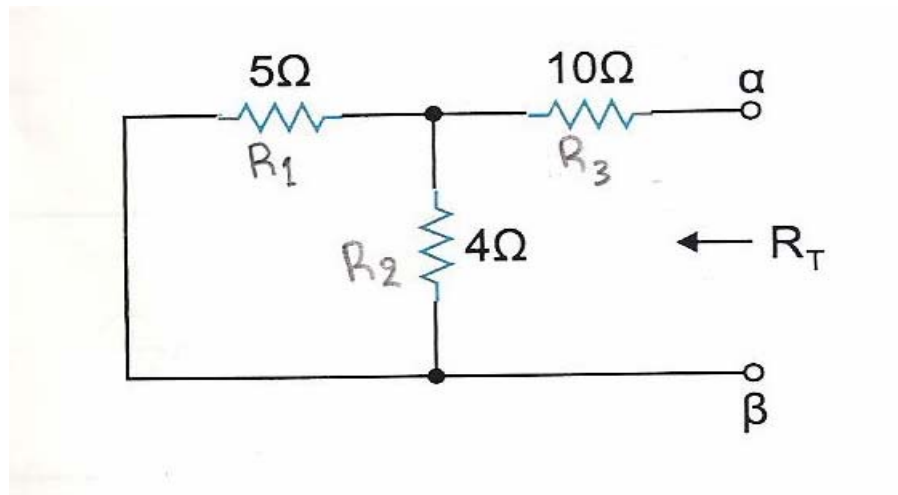
Να υπολογιστεί το ισοδύναμο κατά Thevenin από τα σημεία α-β του κυκλώματος, που φαίνεται στο σχήμα 6.

Λύση



ΣΧΗΜΑ 6

Στο κύκλωμα δεν υπάρχουν εξαρτημένες πηγές τάσης ή ρεύματος. Η τάση Thevenin ισούται με την τάση επάνω στην R_2 γιατί με ανοιχτά τα άκρα α,β η R_3 δεν διαρέεται από ρεύμα. Βραχυκυκλώνουμε τις πηγές V_1 και V_2 , οπότε το κύκλωμα παίρνει την μορφή του σχήματος 7.



ΣΧΗΜΑ 7

Από την σύνθεση των αντιστάσεων προκύπτει

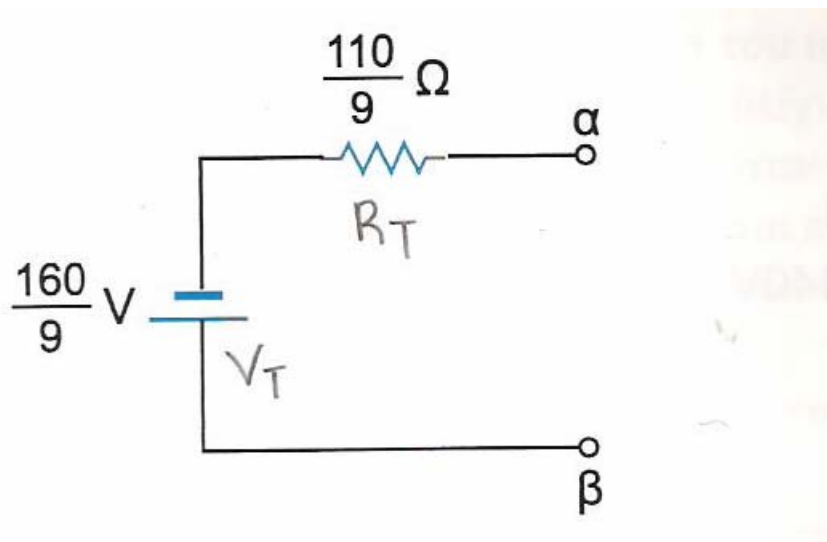
$$R_T = (4 * 5 / 4 + 5) + 10 = 12.22 \text{ ohm}$$

Για τον υπολογισμό της V_T , παρατηρούμε ότι η αντίσταση των R_3 δε διαρρέεται από ρεύμα, με συνέπεια να έχουμε μηδενική πτώση τάσης πάνω στην αντίσταση αυτή. Έτσι η τάση V_T θα ισούται με την πτώση τάσης πάνω στην αντίσταση των R_2 .

Οι δύο πηγές αντιστοιχούν σε μια ισοδύναμη πηγή των 40 Volt με το ίδιο πρόσημο όπως αυτό της πηγής V_1 . Κάνοντας χρήση του θεωρήματος του διαιρέτη τάσης έχουμε

$$V_T = -40 \left(\frac{4}{4+5} \right) = 17.78 \text{ volt}$$

Άρα το ισοδύναμο κατά Thevenin έχει τη μορφή του σχήματος 8.



ΣΧΗΜΑ 8

Βιβλιογραφία

Χατζίκος Ευάγγελος Β. «Matlab για Επιστήμονες και Μηχανικούς»

Παπαμάρκος Νικόλαος Η. «Ανάλυση Ηλεκτρικών Κυκλωμάτων» Τόμος Α

Ευθυμιάτου Δ. «Ηλεκτρικά Κυκλώματα 1»

Βαφειάδης Π. «Ανάλυση Ηλεκτρικών Κυκλωμάτων»

Μάργαρης Ν. «Ηλεκτρικά Κυκλώματα-Φροντιστηριακές Ασκήσεις»

Παράρτημα κώδικα στο Matlab

g_central.m

```
function varargout = g_central(varargin)
% G_CENTRAL M-file for g_central.fig
% G_CENTRAL, by itself, creates a new G_CENTRAL or raises the existing
% singleton*.
%
% H = G_CENTRAL returns the handle to a new G_CENTRAL or the handle to
% the existing singleton*.
%
% G_CENTRAL('CALLBACK',hObject,eventData,handles,...) calls the local
% function named CALLBACK in G_CENTRAL.M with the given input arguments.
%
% G_CENTRAL('Property','Value',...) creates a new G_CENTRAL or raises the
% existing singleton*. Starting from the left, property value pairs are
% applied to the GUI before g_central_OpeningFcn gets called. An
% unrecognized property name or invalid value makes property application
% stop. All inputs are passed to g_central_OpeningFcn via varargin.
%
% *See GUI Options on GUIDE's Tools menu. Choose "GUI allows only one
% instance to run (singleton)".
%
% See also: GUIDE, GUIDATA, GUIHANDLES

% Edit the above text to modify the response to help g_central

% Last Modified by GUIDE v2.5 21-Dec-2013 04:20:48

% Begin initialization code - DO NOT EDIT
gui_Singleton = 1;
gui_State = struct('gui_Name',       mfilename, ...
                  'gui_Singleton',  gui_Singleton, ...
                  'gui_OpeningFcn', @g_central_OpeningFcn, ...
                  'gui_OutputFcn',  @g_central_OutputFcn, ...
                  'gui_LayoutFcn',  [], ...
                  'gui_Callback',   []);
if nargin && ischar(varargin{1})
    gui_State.gui_Callback = str2func(varargin{1});
end

if nargout
    [varargout{1:nargout}] = gui_mainfcn(gui_State, varargin{:});
else
    gui_mainfcn(gui_State, varargin{:});
end
% End initialization code - DO NOT EDIT

% --- Executes just before g_central is made visible.
function g_central_OpeningFcn(hObject, eventdata, handles, varargin)
% This function has no output args, see OutputFcn.
% hObject    handle to figure
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
% varargin   command line arguments to g_central (see VARARGIN)

% Choose default command line output for g_central
handles.output = hObject;

% Update handles structure
guidata(hObject, handles);

% UIWAIT makes g_central wait for user response (see UIRESUME)
% uiwait(handles.figure1);

% --- Outputs from this function are returned to the command line.
function varargout = g_central_OutputFcn(hObject, eventdata, handles)
% varargout  cell array for returning output args (see VARARGOUT);
% hObject    handle to figure
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Get default command line output from handles structure
```

```

varargout{1} = handles.output;

% --- Executes on button press in pushbutton1.
function pushbutton1_Callback(hObject, eventdata, handles)
% hObject handle to pushbutton1 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)
g_asknsn_1

% --- Executes on button press in pushbutton2.
function pushbutton2_Callback(hObject, eventdata, handles)
% hObject handle to pushbutton2 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)
g_asknsn_2

% --- Executes on button press in pushbutton3.
function pushbutton3_Callback(hObject, eventdata, handles)
% hObject handle to pushbutton3 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)
g_asknsn_3

% --- Executes on button press in pushbutton4.
function pushbutton4_Callback(hObject, eventdata, handles)
% hObject handle to pushbutton4 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)
g_asknsn_4

% --- Executes on button press in pushbutton5.
function pushbutton5_Callback(hObject, eventdata, handles)
% hObject handle to pushbutton5 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)
g_asknsn_5

% --- Executes on button press in pushbutton6.
function pushbutton6_Callback(hObject, eventdata, handles)
% hObject handle to pushbutton6 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)
g_asknsn_6

% --- Executes on button press in pushbutton7.
function pushbutton7_Callback(hObject, eventdata, handles)
% hObject handle to pushbutton7 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)
g_asknsn_7

% --- Executes on button press in pushbutton8.
function pushbutton8_Callback(hObject, eventdata, handles)
% hObject handle to pushbutton8 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)
g_asknsn_8

% --- Executes on button press in pushbutton9.
function pushbutton9_Callback(hObject, eventdata, handles)
% hObject handle to pushbutton9 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)
g_asknsn_9

% --- Executes on button press in pushbutton10.
function pushbutton10_Callback(hObject, eventdata, handles)
% hObject handle to pushbutton10 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)
hfin=questdlg('Εξοδος από το πρόγραμμα?');
switch hfin
case 'Yes'
closereq;
end

```

Ασκηση 1

```
function varargout = g_asknsn_1(varargin)
% G_ASKNSN_1 M-file for g_asknsn_1.fig
% G_ASKNSN_1, by itself, creates a new G_ASKNSN_1 or raises the existing
% singleton*.
%
% H = G_ASKNSN_1 returns the handle to a new G_ASKNSN_1 or the handle to
% the existing singleton*.
%
% G_ASKNSN_1('CALLBACK',hObject,eventData,handles,...) calls the local
% function named CALLBACK in G_ASKNSN_1.M with the given input arguments.
%
% G_ASKNSN_1('Property','Value',...) creates a new G_ASKNSN_1 or raises the
% existing singleton*. Starting from the left, property value pairs are
% applied to the GUI before g_asknsn_1_OpeningFcn gets called. An
% unrecognized property name or invalid value makes property application
% stop. All inputs are passed to g_asknsn_1_OpeningFcn via varargin.
%
% *See GUI Options on GUIDE's Tools menu. Choose "GUI allows only one
% instance to run (singleton)".
%
% See also: GUIDE, GUIDATA, GUIHANDLES

% Edit the above text to modify the response to help g_asknsn_1

% Last Modified by GUIDE v2.5 01-Dec-2013 00:25:27

% Begin initialization code - DO NOT EDIT
gui_Singleton = 1;
gui_State = struct('gui_Name',       mfilename, ...
                  'gui_Singleton',   gui_Singleton, ...
                  'gui_OpeningFcn', @g_asknsn_1_OpeningFcn, ...
                  'gui_OutputFcn',  @g_asknsn_1_OutputFcn, ...
                  'gui_LayoutFcn',   [], ...
                  'gui_Callback',    []);
if nargin && ischar(varargin{1})
    gui_State.gui_Callback = str2func(varargin{1});
end

if nargout
    [varargout{1:nargout}] = gui_mainfcn(gui_State, varargin{:});
else
    gui_mainfcn(gui_State, varargin{:});
end
% End initialization code - DO NOT EDIT

% --- Executes just before g_asknsn_1 is made visible.
function g_asknsn_1_OpeningFcn(hObject, eventdata, handles, varargin)
% This function has no output args, see OutputFcn.
% hObject    handle to figure
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
% varargin   command line arguments to g_asknsn_1 (see VARARGIN)

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

    x_back=[-12,12,12,-12];
    y_back=[-12,-12,12,12];

    x_tableau=[-11,11,11,-11];
    y_tableau=[-11,-11,9,9];

    x01=-5;
    y01=5;
    th1=0;

    xres_11=x01+[0.40*sin(th1),0.40*sin(th1)+1.2*cos(th1),...
               -0.40*sin(th1)+1.2*cos(th1),-0.40*sin(th1)];
    yres_11=y01+[-0.40*cos(th1),-0.40*cos(th1)+1.2*sin(th1),...
               0.40*cos(th1)+1.2*sin(th1),0.40*cos(th1)];

    xres_12=x01+[-0.05*sin(th1),-0.05*sin(th1)+0.25*cos(th1),...
               -0.40*sin(th1)+0.3*cos(th1),...
               0.25*sin(th1)+0.45*cos(th1),...
               -0.40*sin(th1)+0.6*cos(th1),...
               0.25*sin(th1)+0.75*cos(th1),...];
```

```

-0.40*sin(th1)+0.9*cos(th1),...
-0.05*sin(th1)+0.95*cos(th1),...
-0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+0.95*cos(th1),...
-0.25*sin(th1)+0.9*cos(th1),...
0.40*sin(th1)+0.75*cos(th1),...
-0.25*sin(th1)+0.6*cos(th1),...
0.40*sin(th1)+0.45*cos(th1),...
-0.25*sin(th1)+0.3*cos(th1),...
0.05*sin(th1)+0.25*cos(th1),...
0.05*sin(th1)];
yres_12=y01+[0.05*cos(th1),0.05*cos(th1)+0.25*sin(th1),...
0.40*cos(th1)+0.3*sin(th1),...
-0.25*cos(th1)+0.45*sin(th1),...
0.40*cos(th1)+0.6*sin(th1),...
-0.250*cos(th1)+0.75*sin(th1),...
0.40*cos(th1)+0.9*sin(th1),...
0.05*cos(th1)+0.95*sin(th1),...
0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+0.95*sin(th1),...
0.25*cos(th1)+0.9*sin(th1),...
-0.40*cos(th1)+0.75*sin(th1),...
0.25*cos(th1)+0.6*sin(th1),...
-0.40*cos(th1)+0.45*sin(th1),...
0.25*cos(th1)+0.3*sin(th1),...
-0.05*cos(th1)+0.25*sin(th1),...
-0.05*cos(th1)];

x02=2;
y02=0;
th2=pi/2;

xres_21=x02+[0.25*sin(th2),0.25*sin(th2)+1.6*cos(th2),...
-0.25*sin(th2)+1.6*cos(th2),-0.25*sin(th2)];
yres_21=y02+[-0.25*cos(th2),-0.25*cos(th2)+1.6*sin(th2),...
0.25*cos(th2)+1.6*sin(th2),0.25*cos(th2)];

xres_22=x02+[-0.03*sin(th2),-0.03*sin(th2)+0.33*cos(th2),...
-0.25*sin(th2)+0.4*cos(th2),...
0.10*sin(th2)+0.6*cos(th2),...
-0.25*sin(th2)+0.8*cos(th2),...
0.10*sin(th2)+1.0*cos(th2),...
-0.25*sin(th2)+1.2*cos(th2),...
-0.03*sin(th2)+1.27*cos(th2),...
-0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.27*cos(th2),...
-0.10*sin(th2)+1.2*cos(th2),...
0.25*sin(th2)+1.0*cos(th2),...
-0.10*sin(th2)+0.8*cos(th2),...
0.25*sin(th2)+0.6*cos(th2),...
-0.10*sin(th2)+0.4*cos(th2),...
0.03*sin(th2)+0.33*cos(th2),...
0.03*sin(th2)];
yres_22=y02+[0.03*cos(th2),0.03*cos(th2)+0.33*sin(th2),...
0.25*cos(th2)+0.4*sin(th2),...
-0.10*cos(th2)+0.6*sin(th2),...
0.25*cos(th2)+0.8*sin(th2),...
-0.10*cos(th2)+1.0*sin(th2),...
0.25*cos(th2)+1.2*sin(th2),...
0.03*cos(th2)+1.27*sin(th2),...
0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.27*sin(th2),...
0.10*cos(th2)+1.2*sin(th2),...
-0.25*cos(th2)+1.0*sin(th2),...
0.10*cos(th2)+0.8*sin(th2),...
-0.25*cos(th2)+0.6*sin(th2),...
0.10*cos(th2)+0.4*sin(th2),...
-0.03*cos(th2)+0.33*sin(th2),...
-0.03*cos(th2)];

x03=5;
y03=5;
th3=0;

```

```

xres_31=x03+[0.40*sin(th3),0.40*sin(th3)+1.2*cos(th3),...
-0.40*sin(th3)+1.2*cos(th3),-0.40*sin(th3)];
yres_31=y03+[-0.40*cos(th3),-0.40*cos(th3)+1.2*sin(th3),...
0.40*cos(th3)+1.2*sin(th3),0.40*cos(th3)];

xres_32=x03+[-0.05*sin(th3),-0.05*sin(th3)+0.25*cos(th3),...
-0.40*sin(th3)+0.3*cos(th3),...
0.25*sin(th3)+0.45*cos(th3),...
-0.40*sin(th3)+0.6*cos(th3),...
0.25*sin(th3)+0.75*cos(th3),...
-0.40*sin(th3)+0.9*cos(th3),...
-0.05*sin(th3)+0.95*cos(th3),...
-0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+0.95*cos(th3),...
-0.25*sin(th3)+0.9*cos(th3),...
0.40*sin(th3)+0.75*cos(th3),...
-0.25*sin(th3)+0.6*cos(th3),...
0.40*sin(th3)+0.45*cos(th3),...
-0.25*sin(th3)+0.3*cos(th3),...
0.05*sin(th3)+0.25*cos(th3),...
0.05*sin(th3)];
yres_32=y03+[0.05*cos(th3),0.05*cos(th3)+0.25*sin(th3),...
0.40*cos(th3)+0.3*sin(th3),...
-0.25*cos(th3)+0.45*sin(th3),...
0.40*cos(th3)+0.6*sin(th3),...
-0.25*cos(th3)+0.75*sin(th3),...
0.40*cos(th3)+0.9*sin(th3),...
0.05*cos(th3)+0.95*sin(th3),...
0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+0.95*sin(th3),...
0.25*cos(th3)+0.9*sin(th3),...
-0.40*cos(th3)+0.75*sin(th3),...
0.25*cos(th3)+0.6*sin(th3),...
-0.40*cos(th3)+0.45*sin(th3),...
0.25*cos(th3)+0.3*sin(th3),...
-0.05*cos(th3)+0.25*sin(th3),...
-0.05*cos(th3)];

x04=-8;
y04=0;

xv1_1=x04+[-1.0,1.0,1.0,-1.0];
yv1_1=y04+[-0.05,-0.05,0.05,0.05]-0.1;

xv1_2=x04+[-0.4,0.4,0.4,-0.4];
yv1_2=y04+[-0.1,-0.1,0.1,0.1]+0.3;

x05=-1;
y05=5;

xv2_1=x05+[-0.032,0.032,0.032,-0.032]+0.1;
yv2_1=y05+[-1.5,-1.5,1.5,1.5];

xv2_2=x05+[-0.05,0.05,0.05,-0.05]-0.2;
yv2_2=y05+[-0.75,-0.75,0.75,0.75];

xcable1=[-8,-8,-5,-5];
ycable1=y01+[0.1,-0.1,-0.1,0.1];

xcable2=[-8.05,-7.95,-7.95,-8.05];
ycable2=[y01+0.1,y01+0.1,y04+0.4,y04+0.4];

xcable3=[-8.05,-7.95,-7.95,-8.05];
ycable3=[y04-0.15,y04-0.15,-5.0,-5.0];

xcable4=[-8,-8,9,9];
ycable4=-5.0+[0.1,-0.1,-0.1,0.1];

xcable5=[-3.8,-3.8,-1.25,-1.25];
ycable5=y01+[0.1,-0.1,-0.1,0.1];

xcable6=[x05+0.132,x05+0.132,5,5];
ycable6=y01+[0.1,-0.1,-0.1,0.1];

```



```

        xcable7=[6.2,6.2,9,9];
        ycable7=y01+[0.1,-0.1,-0.1,0.1];

        xcable8=[-8.05,-7.95,-7.95,-8.05]+10;
        ycable8=[y01+0.1,y01+0.1,y02+1.6,y02+1.6];

        xcable9=[-8.05,-7.95,-7.95,-8.05]+10;
        ycable9=[-4.9,-4.9,y02,y02];
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

        fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
        xres_11,yres_11,[1.0,1.0,1.0],...
        xres_12,yres_12,[0.0,0.0,0.0],...
        xres_21,yres_21,[1.0,1.0,1.0],...
        xres_22,yres_22,[0.0,0.0,0.0],...
        xres_31,yres_31,[1.0,1.0,1.0],...
        xres_32,yres_32,[0.0,0.0,0.0],...
        xV1_1,yV1_1,[0.0,0.0,0.0],...
        xV1_2,yV1_2,[0.0,0.0,0.0],...
        xV2_1,yV2_1,[0.0,0.0,0.0],...
        xV2_2,yV2_2,[0.0,0.0,0.0],...
        xcable1,ycable1,[0.8,0.6,0.2],...
        xcable2,ycable2,[0.8,0.6,0.2],...
        xcable3,ycable3,[0.8,0.6,0.2],...
        xcable4,ycable4,[0.8,0.6,0.2],...
        xcable5,ycable5,[0.8,0.6,0.2],...
        xcable6,ycable6,[0.8,0.6,0.2],...
        xcable7,ycable7,[0.8,0.6,0.2],...
        xcable8,ycable8,[0.8,0.6,0.2],...
        xcable9,ycable9,[0.8,0.6,0.2],...
        'LineStyle','None')

text(-11,11,'Να υπολογιστεί το ισοδύναμο κατά Thevenin από τα σημεία a, b του παρακάτω κυκλώματος')
text(-4.5,6.5,'R_1','Color',[0.9,0.2,0.0])
text(2.5,0.7,'R_2','Color',[0.9,0.2,0.0])
text(5.5,6.5,'R_3','Color',[0.9,0.2,0.0])
text(-9.5,0.5,'V_1','Color',[0.0,0.2,0.9])
text(-0.5,6.5,'V_2','Color',[0.0,0.2,0.9])
text(9.5,5.0,'a','Color',[0.9,0.0,0.9])
text(9.5,-5.0,'b','Color',[0.9,0.0,0.9])

        axis([-12,12,-12,12])
        axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

        % Choose default command line output for g_asknsn_1
        handles.output = hObject;

        % Update handles structure
        guidata(hObject, handles);

        % UIWAIT makes g_asknsn_1 wait for user response (see UIRESUME)
        % uiwait(handles.figure1);

        % --- Outputs from this function are returned to the command line.
function varargout = g_asknsn_1_OutputFcn(hObject, eventdata, handles)
% varargout cell array for returning output args (see VARARGOUT);
% hObject handle to figure
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

        % Get default command line output from handles structure
        varargout{1} = handles.output;

function edit1_Callback(hObject, eventdata, handles)
% hObject handle to edit1 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

        % Hints: get(hObject,'String') returns contents of edit1 as text
% str2double(get(hObject,'String')) returns contents of edit1 as a double
%

        % --- Executes during object creation, after setting all properties.

```

```

function edit1_CreateFcn(hObject, eventdata, handles)
    % hObject      handle to edit1 (see GCBO)
    % eventdata   reserved - to be defined in a future version of MATLAB
    % handles     empty - handles not created until after all CreateFcns called

    % Hint: edit controls usually have a white background on Windows.
    %         See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit2_Callback(hObject, eventdata, handles)
    % hObject      handle to edit2 (see GCBO)
    % eventdata   reserved - to be defined in a future version of MATLAB
    % handles     structure with handles and user data (see GUIDATA)

    % Hints: get(hObject,'String') returns contents of edit2 as text
    %         str2double(get(hObject,'String')) returns contents of edit2 as a double

    % --- Executes during object creation, after setting all properties.
function edit2_CreateFcn(hObject, eventdata, handles)
    % hObject      handle to edit2 (see GCBO)
    % eventdata   reserved - to be defined in a future version of MATLAB
    % handles     empty - handles not created until after all CreateFcns called

    % Hint: edit controls usually have a white background on Windows.
    %         See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit3_Callback(hObject, eventdata, handles)
    % hObject      handle to edit3 (see GCBO)
    % eventdata   reserved - to be defined in a future version of MATLAB
    % handles     structure with handles and user data (see GUIDATA)

    % Hints: get(hObject,'String') returns contents of edit3 as text
    %         str2double(get(hObject,'String')) returns contents of edit3 as a double

    % --- Executes during object creation, after setting all properties.
function edit3_CreateFcn(hObject, eventdata, handles)
    % hObject      handle to edit3 (see GCBO)
    % eventdata   reserved - to be defined in a future version of MATLAB
    % handles     empty - handles not created until after all CreateFcns called

    % Hint: edit controls usually have a white background on Windows.
    %         See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit4_Callback(hObject, eventdata, handles)
    % hObject      handle to edit4 (see GCBO)
    % eventdata   reserved - to be defined in a future version of MATLAB
    % handles     structure with handles and user data (see GUIDATA)

    % Hints: get(hObject,'String') returns contents of edit4 as text
    %         str2double(get(hObject,'String')) returns contents of edit4 as a double

    % --- Executes during object creation, after setting all properties.
function edit4_CreateFcn(hObject, eventdata, handles)
    % hObject      handle to edit4 (see GCBO)
    % eventdata   reserved - to be defined in a future version of MATLAB
    % handles     empty - handles not created until after all CreateFcns called

    % Hint: edit controls usually have a white background on Windows.
    %         See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

```

```

        function edit5_Callback(hObject, eventdata, handles)
            % hObject    handle to edit5 (see GCBO)
            % eventdata reserved - to be defined in a future version of MATLAB
            % handles    structure with handles and user data (see GUIDATA)

            % Hints: get(hObject,'String') returns contents of edit5 as text
            % str2double(get(hObject,'String')) returns contents of edit5 as a double

            % --- Executes during object creation, after setting all properties.
            function edit5_CreateFcn(hObject, eventdata, handles)
                % hObject    handle to edit5 (see GCBO)
                % eventdata reserved - to be defined in a future version of MATLAB
                % handles    empty - handles not created until after all CreateFcns called

                % Hint: edit controls usually have a white background on Windows.
                %         See ISPC and COMPUTER.
            if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
                set(hObject,'BackgroundColor','white');
            end

            % --- Executes on button press in pushbutton1.
            function pushbutton1_Callback(hObject, eventdata, handles)
                % hObject    handle to pushbutton1 (see GCBO)
                % eventdata reserved - to be defined in a future version of MATLAB
                % handles    structure with handles and user data (see GUIDATA)

                %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
                global R1;
                global R2;
                global R3;
                global V1;
                global V2;

                R1=str2double(get(handles.edit1,'String'));
                R2=str2double(get(handles.edit2,'String'));
                R3=str2double(get(handles.edit3,'String'));
                V1=str2double(get(handles.edit4,'String'));
                V2=str2double(get(handles.edit5,'String'));

                if (R1>10|R1<1)
                    h=warndlg('Βάλτε στην αντίσταση R1 τιμή μεταξύ 1 και 10');
                    return
                    end

                if (R2>10|R2<1)
                    h=warndlg('Βάλτε στην αντίσταση R2 τιμή μεταξύ 1 και 10');
                    return
                    end

                if (R3>10|R3<1)
                    h=warndlg('Βάλτε στην αντίσταση R3 τιμή μεταξύ 1 και 10');
                    return
                    end

                if (V1>150|V1<100)
                    h=warndlg('Βάλτε στην τάση V1 τιμή μεταξύ 100 και 150');
                    return
                    end

                if (V2>150|V2<100)
                    h=warndlg('Βάλτε στην τάση V2 τιμή μεταξύ 100 και 150');
                    return
                    end

                % set(handles.pushbutton1,'enable','off');

                axes(handles.axes1)
                axis off;
                %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
                global snmeio;

                snmeio=1;
                %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
                x_back=[-12,12,12,-12];
                y_back=[-12,-12,12,12];

                x_tableau=[-11,11,11,-11];

```

```

y_tableau=[-11,-11,9,9];

x01=-5;
y01=5;
th1=0;

xres_11=x01+[0.40*sin(th1),0.40*sin(th1)+1.2*cos(th1),...
-0.40*sin(th1)+1.2*cos(th1),-0.40*sin(th1)];
yres_11=y01+[-0.40*cos(th1),-0.40*cos(th1)+1.2*sin(th1),...
0.40*cos(th1)+1.2*sin(th1),0.40*cos(th1)];

xres_12=x01+[-0.05*sin(th1),-0.05*sin(th1)+0.25*cos(th1),...
-0.40*sin(th1)+0.3*cos(th1),...
0.25*sin(th1)+0.45*cos(th1),...
-0.40*sin(th1)+0.6*cos(th1),...
0.25*sin(th1)+0.75*cos(th1),...
-0.40*sin(th1)+0.9*cos(th1),...
-0.05*sin(th1)+0.95*cos(th1),...
-0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+0.95*cos(th1),...
-0.25*sin(th1)+0.9*cos(th1),...
0.40*sin(th1)+0.75*cos(th1),...
-0.25*sin(th1)+0.6*cos(th1),...
0.40*sin(th1)+0.45*cos(th1),...
-0.25*sin(th1)+0.3*cos(th1),...
0.05*sin(th1)+0.25*cos(th1),...
0.05*sin(th1)];
yres_12=y01+[0.05*cos(th1),0.05*cos(th1)+0.25*sin(th1),...
0.40*cos(th1)+0.3*sin(th1),...
-0.25*cos(th1)+0.45*sin(th1),...
0.40*cos(th1)+0.6*sin(th1),...
-0.25*cos(th1)+0.75*sin(th1),...
0.40*cos(th1)+0.9*sin(th1),...
0.05*cos(th1)+0.95*sin(th1),...
0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+0.95*sin(th1),...
0.25*cos(th1)+0.9*sin(th1),...
-0.40*cos(th1)+0.75*sin(th1),...
0.25*cos(th1)+0.6*sin(th1),...
-0.40*cos(th1)+0.45*sin(th1),...
0.25*cos(th1)+0.3*sin(th1),...
-0.05*cos(th1)+0.25*sin(th1),...
-0.05*cos(th1)];

x02=2;
y02=0;
th2=pi/2;

xres_21=x02+[0.25*sin(th2),0.25*sin(th2)+1.6*cos(th2),...
-0.25*sin(th2)+1.6*cos(th2),-0.25*sin(th2)];
yres_21=y02+[-0.25*cos(th2),-0.25*cos(th2)+1.6*sin(th2),...
0.25*cos(th2)+1.6*sin(th2),0.25*cos(th2)];

xres_22=x02+[-0.03*sin(th2),-0.03*sin(th2)+0.33*cos(th2),...
-0.25*sin(th2)+0.4*cos(th2),...
0.10*sin(th2)+0.6*cos(th2),...
-0.25*sin(th2)+0.8*cos(th2),...
0.10*sin(th2)+1.0*cos(th2),...
-0.25*sin(th2)+1.2*cos(th2),...
-0.03*sin(th2)+1.27*cos(th2),...
-0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.27*cos(th2),...
-0.10*sin(th2)+1.2*cos(th2),...
0.25*sin(th2)+1.0*cos(th2),...
-0.10*sin(th2)+0.8*cos(th2),...
0.25*sin(th2)+0.6*cos(th2),...
-0.10*sin(th2)+0.4*cos(th2),...
0.03*sin(th2)+0.33*cos(th2),...
0.03*sin(th2)];
yres_22=y02+[0.03*cos(th2),0.03*cos(th2)+0.33*sin(th2),...
0.25*cos(th2)+0.4*sin(th2),...
-0.10*cos(th2)+0.6*sin(th2),...
0.25*cos(th2)+0.8*sin(th2),...
-0.10*cos(th2)+1.0*sin(th2),...
0.25*cos(th2)+1.2*sin(th2),...
0.03*cos(th2)+1.27*sin(th2),...
0.03*cos(th2)];

```

```

0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.27*sin(th2),...
0.10*cos(th2)+1.2*sin(th2),...
-0.25*cos(th2)+1.0*sin(th2),...
0.10*cos(th2)+0.8*sin(th2),...
-0.25*cos(th2)+0.6*sin(th2),...
0.10*cos(th2)+0.4*sin(th2),...
-0.03*cos(th2)+0.33*sin(th2),...
-0.03*cos(th2)];

x03=5;
y03=5;
th3=0;

xres_31=x03+[0.40*sin(th3),0.40*sin(th3)+1.2*cos(th3),...
-0.40*sin(th3)+1.2*cos(th3),-0.40*sin(th3)];
yres_31=y03+[-0.40*cos(th3),-0.40*cos(th3)+1.2*sin(th3),...
0.40*cos(th3)+1.2*sin(th3),0.40*cos(th3)];

xres_32=x03+[-0.05*sin(th3),-0.05*sin(th3)+0.25*cos(th3),...
-0.40*sin(th3)+0.3*cos(th3),...
0.25*sin(th3)+0.45*cos(th3),...
-0.40*sin(th3)+0.6*cos(th3),...
0.25*sin(th3)+0.75*cos(th3),...
-0.40*sin(th3)+0.9*cos(th3),...
-0.05*sin(th3)+0.95*cos(th3),...
-0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+0.95*cos(th3),...
-0.25*sin(th3)+0.9*cos(th3),...
0.40*sin(th3)+0.75*cos(th3),...
-0.25*sin(th3)+0.6*cos(th3),...
0.40*sin(th3)+0.45*cos(th3),...
-0.25*sin(th3)+0.3*cos(th3),...
0.05*sin(th3)+0.25*cos(th3),...
0.05*sin(th3)];
yres_32=y03+[0.05*cos(th3),0.05*cos(th3)+0.25*sin(th3),...
0.40*cos(th3)+0.3*sin(th3),...
-0.25*cos(th3)+0.45*sin(th3),...
0.40*cos(th3)+0.6*sin(th3),...
-0.250*cos(th3)+0.75*sin(th3),...
0.40*cos(th3)+0.9*sin(th3),...
0.05*cos(th3)+0.95*sin(th3),...
0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+0.95*sin(th3),...
0.25*cos(th3)+0.9*sin(th3),...
-0.40*cos(th3)+0.75*sin(th3),...
0.25*cos(th3)+0.6*sin(th3),...
-0.40*cos(th3)+0.45*sin(th3),...
0.25*cos(th3)+0.3*sin(th3),...
-0.05*cos(th3)+0.25*sin(th3),...
-0.05*cos(th3)];

x04=-8;
y04=0;

xv1_1=x04+[-1.0,1.0,1.0,-1.0];
yv1_1=y04+[-0.05,-0.05,0.05,0.05]-0.1;

xv1_2=x04+[-0.4,0.4,0.4,-0.4];
yv1_2=y04+[-0.1,-0.1,0.1,0.1]+0.3;

x05=-1;
y05=5;

xv2_1=x05+[-0.032,0.032,0.032,-0.032]+0.1;
yv2_1=y05+[-1.5,-1.5,1.5,1.5];

xv2_2=x05+[-0.05,0.05,0.05,-0.05]-0.2;
yv2_2=y05+[-0.75,-0.75,0.75,0.75];

xcable1=[-8,-8,-5,-5];

```

```

        ycable1=y01+[0.1,-0.1,-0.1,0.1];

        xcable2=[-8.05,-7.95,-7.95,-8.05];
        ycable2=[y01+0.1,y01+0.1,y04+0.4,y04+0.4];

        xcable3=[-8.05,-7.95,-7.95,-8.05];
        ycable3=[y04-0.15,y04-0.15,-5.0,-5.0];

        xcable4=[-8,-8,9,9];
        ycable4=-5.0+[0.1,-0.1,-0.1,0.1];

        xcable5=[-3.8,-3.8,-1.25,-1.25];
        ycable5=y01+[0.1,-0.1,-0.1,0.1];

        xcable6=[x05+0.132,x05+0.132,5,5];
        ycable6=y01+[0.1,-0.1,-0.1,0.1];

        xcable7=[6.2,6.2,9,9];
        ycable7=y01+[0.1,-0.1,-0.1,0.1];

        xcable8=[-8.05,-7.95,-7.95,-8.05]+10;
        ycable8=[y01+0.1,y01+0.1,y02+1.6,y02+1.6];

        xcable9=[-8.05,-7.95,-7.95,-8.05]+10;
        ycable9=[-4.9,-4.9,y02,y02];
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

        fill(x_back,y_back,[1.0,1.0,1.0],...
        x_tableau,y_tableau,[0.6,0.6,0.6],...
        xres_11,yres_11,[1.0,1.0,1.0],...
        xres_12,yres_12,[0.0,0.0,0.0],...
        xres_21,yres_21,[1.0,1.0,1.0],...
        xres_22,yres_22,[0.0,0.0,0.0],...
        xres_31,yres_31,[1.0,1.0,1.0],...
        xres_32,yres_32,[0.0,0.0,0.0],...
        xV1_1,yV1_1,[0.0,0.0,0.0],...
        xV1_2,yV1_2,[0.0,0.0,0.0],...
        xV2_1,yV2_1,[0.0,0.0,0.0],...
        xV2_2,yV2_2,[0.0,0.0,0.0],...
        xcable1,ycable1,[0.8,0.6,0.2],...
        xcable2,ycable2,[0.8,0.6,0.2],...
        xcable3,ycable3,[0.8,0.6,0.2],...
        xcable4,ycable4,[0.8,0.6,0.2],...
        xcable5,ycable5,[0.8,0.6,0.2],...
        xcable6,ycable6,[0.8,0.6,0.2],...
        xcable7,ycable7,[0.8,0.6,0.2],...
        xcable8,ycable8,[0.8,0.6,0.2],...
        xcable9,ycable9,[0.8,0.6,0.2],...
        'LineStyle','None')

        text(-11,11,'Δεν υπάρχουν εξαρτημένες πηγές τάσης ή ρεύματος. Η τάση Thevenin ισούται με την τάση επάνω στην
        R_2')
        text(-11,10.0,'γιατί με ανοικτά τα άκρα a, b, η R_3 δεν διαρρέεται από ρεύμα. Βραχυκυκλώνουμε τις πηγές V1, V2')
        text(-4.5,6.5,'R_1','Color',[0.9,0.2,0.0])
        text(2.5,0.7,'R_2','Color',[0.9,0.2,0.0])
        text(5.5,6.5,'R_3','Color',[0.9,0.2,0.0])
        text(-9.5,0.5,'V_1','Color',[0.0,0.2,0.9])
        text(-0.5,6.5,'V_2','Color',[0.0,0.2,0.9])
        text(9.5,5.0,'a','Color',[0.9,0.0,0.9])
        text(9.5,-5.0,'b','Color',[0.9,0.0,0.9])

        axis([-12,12,-12,12])
        axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

% --- Executes on button press in pushbutton2.
function pushbutton2_Callback(hObject, eventdata, handles)
% hObject handle to pushbutton2 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

global R1;
global R2;
global R3;
global V1;
global V2;

```

```

        global snmeio;

        snmeio=snmeio+1;

        if (snmeio==4)
            snmeio=1;
        end

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
        RT=R1*R2/(R1+R2)+R3;
        VT=R2*(V1-V2)/(R1+R2);
        nRT=num2str(0.01*round(100*RT));
        nVT=num2str(0.01*round(100*VT));
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

        if (snmeio==1)
            axes(handles.axes1);
            cla

            x_back=[-12,12,12,-12];
            y_back=[-12,-12,12,12];

            x_tableau=[-11,11,11,-11];
            y_tableau=[-11,-11,9,9];

            x01=-5;
            y01=5;
            th1=0;

            xres_11=x01+[0.40*sin(th1),0.40*sin(th1)+1.2*cos(th1),...
                -0.40*sin(th1)+1.2*cos(th1),-0.40*sin(th1)];
            yres_11=y01+[-0.40*cos(th1),-0.40*cos(th1)+1.2*sin(th1),...
                0.40*cos(th1)+1.2*sin(th1),0.40*cos(th1)];

            xres_12=x01+[-0.05*sin(th1),-0.05*sin(th1)+0.25*cos(th1),...
                -0.40*sin(th1)+0.3*cos(th1),...
                0.25*sin(th1)+0.45*cos(th1),...
                -0.40*sin(th1)+0.6*cos(th1),...
                0.25*sin(th1)+0.75*cos(th1),...
                -0.40*sin(th1)+0.9*cos(th1),...
                -0.05*sin(th1)+0.95*cos(th1),...
                -0.05*sin(th1)+1.2*cos(th1),...
                0.05*sin(th1)+1.2*cos(th1),...
                0.05*sin(th1)+0.95*cos(th1),...
                -0.25*sin(th1)+0.9*cos(th1),...
                0.40*sin(th1)+0.75*cos(th1),...
                -0.25*sin(th1)+0.6*cos(th1),...
                0.40*sin(th1)+0.45*cos(th1),...
                -0.25*sin(th1)+0.3*cos(th1),...
                0.05*sin(th1)+0.25*cos(th1),...
                0.05*sin(th1)];
            yres_12=y01+[0.05*cos(th1),0.05*cos(th1)+0.25*sin(th1),...
                0.40*cos(th1)+0.3*sin(th1),...
                -0.25*cos(th1)+0.45*sin(th1),...
                0.40*cos(th1)+0.6*sin(th1),...
                -0.250*cos(th1)+0.75*sin(th1),...
                0.40*cos(th1)+0.9*sin(th1),...
                0.05*cos(th1)+0.95*sin(th1),...
                0.05*cos(th1)+1.2*sin(th1),...
                -0.05*cos(th1)+1.2*sin(th1),...
                -0.05*cos(th1)+0.95*sin(th1),...
                0.25*cos(th1)+0.9*sin(th1),...
                -0.40*cos(th1)+0.75*sin(th1),...
                0.25*cos(th1)+0.6*sin(th1),...
                -0.40*cos(th1)+0.45*sin(th1),...
                0.25*cos(th1)+0.3*sin(th1),...
                -0.05*cos(th1)+0.25*sin(th1),...
                -0.05*cos(th1)];

            x02=2;
            y02=0;
            th2=pi/2;

            xres_21=x02+[0.25*sin(th2),0.25*sin(th2)+1.6*cos(th2),...
                -0.25*sin(th2)+1.6*cos(th2),-0.25*sin(th2)];
            yres_21=y02+[-0.25*cos(th2),-0.25*cos(th2)+1.6*sin(th2),...
                0.25*cos(th2)+1.6*sin(th2),0.25*cos(th2)];

```

```

xres_22=x02+[-0.03*sin(th2),-0.03*sin(th2)+0.33*cos(th2),...
-0.25*sin(th2)+0.4*cos(th2),...
0.10*sin(th2)+0.6*cos(th2),...
-0.25*sin(th2)+0.8*cos(th2),...
0.10*sin(th2)+1.0*cos(th2),...
-0.25*sin(th2)+1.2*cos(th2),...
-0.03*sin(th2)+1.27*cos(th2),...
-0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.27*cos(th2),...
-0.10*sin(th2)+1.2*cos(th2),...
0.25*sin(th2)+1.0*cos(th2),...
-0.10*sin(th2)+0.8*cos(th2),...
0.25*sin(th2)+0.6*cos(th2),...
-0.10*sin(th2)+0.4*cos(th2),...
0.03*sin(th2)+0.33*cos(th2),...
0.03*sin(th2)];
yres_22=y02+[0.03*cos(th2),0.03*cos(th2)+0.33*sin(th2),...
0.25*cos(th2)+0.4*sin(th2),...
-0.10*cos(th2)+0.6*sin(th2),...
0.25*cos(th2)+0.8*sin(th2),...
-0.10*cos(th2)+1.0*sin(th2),...
0.25*cos(th2)+1.2*sin(th2),...
0.03*cos(th2)+1.27*sin(th2),...
0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.27*sin(th2),...
0.10*cos(th2)+1.2*sin(th2),...
-0.25*cos(th2)+1.0*sin(th2),...
0.10*cos(th2)+0.8*sin(th2),...
-0.25*cos(th2)+0.6*sin(th2),...
0.10*cos(th2)+0.4*sin(th2),...
-0.03*cos(th2)+0.33*sin(th2),...
-0.03*cos(th2)];

x03=5;
y03=5;
th3=0;

xres_31=x03+[0.40*sin(th3),0.40*sin(th3)+1.2*cos(th3),...
-0.40*sin(th3)+1.2*cos(th3),-0.40*sin(th3)];
yres_31=y03+[-0.40*cos(th3),-0.40*cos(th3)+1.2*sin(th3),...
0.40*cos(th3)+1.2*sin(th3),0.40*cos(th3)];

xres_32=x03+[-0.05*sin(th3),-0.05*sin(th3)+0.25*cos(th3),...
-0.40*sin(th3)+0.3*cos(th3),...
0.25*sin(th3)+0.45*cos(th3),...
-0.40*sin(th3)+0.6*cos(th3),...
0.25*sin(th3)+0.75*cos(th3),...
-0.40*sin(th3)+0.9*cos(th3),...
-0.05*sin(th3)+0.95*cos(th3),...
-0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+0.95*cos(th3),...
-0.25*sin(th3)+0.9*cos(th3),...
0.40*sin(th3)+0.75*cos(th3),...
-0.25*sin(th3)+0.6*cos(th3),...
0.40*sin(th3)+0.45*cos(th3),...
-0.25*sin(th3)+0.3*cos(th3),...
0.05*sin(th3)+0.25*cos(th3),...
0.05*sin(th3)];
yres_32=y03+[0.05*cos(th3),0.05*cos(th3)+0.25*sin(th3),...
0.40*cos(th3)+0.3*sin(th3),...
-0.25*cos(th3)+0.45*sin(th3),...
0.40*cos(th3)+0.6*sin(th3),...
-0.25*cos(th3)+0.75*sin(th3),...
0.40*cos(th3)+0.9*sin(th3),...
0.05*cos(th3)+0.95*sin(th3),...
0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+0.95*sin(th3),...
0.25*cos(th3)+0.9*sin(th3),...
-0.40*cos(th3)+0.75*sin(th3),...
0.25*cos(th3)+0.6*sin(th3),...
-0.40*cos(th3)+0.45*sin(th3),...
0.25*cos(th3)+0.3*sin(th3),...
-0.05*cos(th3)+0.25*sin(th3),...
-0.05*cos(th3)];

```



```

x04=-8;
y04=0;

xV1_1=x04+[-1.0,1.0,1.0,-1.0];
yV1_1=y04+[-0.05,-0.05,0.05,0.05]-0.1;

xV1_2=x04+[-0.4,0.4,0.4,-0.4];
yV1_2=y04+[-0.1,-0.1,0.1,0.1]+0.3;

x05=-1;
y05=5;

xV2_1=x05+[-0.032,0.032,0.032,-0.032]+0.1;
yV2_1=y05+[-1.5,-1.5,1.5,1.5];

xV2_2=x05+[-0.05,0.05,0.05,-0.05]-0.2;
yV2_2=y05+[-0.75,-0.75,0.75,0.75];

xcable1=[-8,-8,-5,-5];
ycable1=y01+[0.1,-0.1,-0.1,0.1];

xcable2=[-8.05,-7.95,-7.95,-8.05];
ycable2=[y01+0.1,y01+0.1,y04+0.4,y04+0.4];

xcable3=[-8.05,-7.95,-7.95,-8.05];
ycable3=[y04-0.15,y04-0.15,-5.0,-5.0];

xcable4=[-8,-8,9,9];
ycable4=-5.0+[0.1,-0.1,-0.1,0.1];

xcable5=[-3.8,-3.8,-1.25,-1.25];
ycable5=y01+[0.1,-0.1,-0.1,0.1];

xcable6=[x05+0.132,x05+0.132,5,5];
ycable6=y01+[0.1,-0.1,-0.1,0.1];

xcable7=[6.2,6.2,9,9];
ycable7=y01+[0.1,-0.1,-0.1,0.1];

xcable8=[-8.05,-7.95,-7.95,-8.05]+10;
ycable8=[y01+0.1,y01+0.1,y02+1.6,y02+1.6];

xcable9=[-8.05,-7.95,-7.95,-8.05]+10;
ycable9=[-4.9,-4.9,y02,y02];
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_11,yres_11,[1.0,1.0,1.0],...
xres_12,yres_12,[0.0,0.0,0.0],...
xres_21,yres_21,[1.0,1.0,1.0],...
xres_22,yres_22,[0.0,0.0,0.0],...
xres_31,yres_31,[1.0,1.0,1.0],...
xres_32,yres_32,[0.0,0.0,0.0],...
xV1_1,yV1_1,[0.0,0.0,0.0],...
xV1_2,yV1_2,[0.0,0.0,0.0],...
xV2_1,yV2_1,[0.0,0.0,0.0],...
xV2_2,yV2_2,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
'Linestyle','None')

text(-11,11,'Δεν υπάρχουν εξαρτημένες πηγές τάσης ή ρεύματος. Η τάση Thevenin ισούται με την τάση επάνω στην
R_2')
text(-11,10.0,'γιατί με ανοικτά τα άκρα a, b, η R_3 δεν διαρρέεται από ρεύμα. Βραχυκυκλώνουμε τις πηγές V1, V2')
text(-4.5,6.5,'R_1','Color',[0.9,0.2,0.0])
text(2.5,0.7,'R_2','Color',[0.9,0.2,0.0])
text(5.5,6.5,'R_3','Color',[0.9,0.2,0.0])

```

```

text(-9.5,0.5,'V_1','Color',[0.0,0.2,0.9])
text(-0.5,6.5,'V_2','Color',[0.0,0.2,0.9])
text(9.5,5.0,'a','Color',[0.9,0.0,0.9])
text(9.5,-5.0,'b','Color',[0.9,0.0,0.9])

axis([-12,12,-12,12])
axis off;

elseif (snmeio==2)

axes(handles.axes1);
cla

x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,9,9];

x01=-5;
y01=5;
th1=0;

xres_11=x01+[0.40*sin(th1),0.40*sin(th1)+1.2*cos(th1),...
-0.40*sin(th1)+1.2*cos(th1),-0.40*sin(th1)];
yres_11=y01+[-0.40*cos(th1),-0.40*cos(th1)+1.2*sin(th1),...
0.40*cos(th1)+1.2*sin(th1),0.40*cos(th1)];

xres_12=x01+[-0.05*sin(th1),-0.05*sin(th1)+0.25*cos(th1),...
-0.40*sin(th1)+0.3*cos(th1),...
0.25*sin(th1)+0.45*cos(th1),...
-0.40*sin(th1)+0.6*cos(th1),...
0.25*sin(th1)+0.75*cos(th1),...
-0.40*sin(th1)+0.9*cos(th1),...
-0.05*sin(th1)+0.95*cos(th1),...
-0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+0.95*cos(th1),...
-0.25*sin(th1)+0.9*cos(th1),...
0.40*sin(th1)+0.75*cos(th1),...
-0.25*sin(th1)+0.6*cos(th1),...
0.40*sin(th1)+0.45*cos(th1),...
-0.25*sin(th1)+0.3*cos(th1),...
0.05*sin(th1)+0.25*cos(th1),...
0.05*sin(th1)];
yres_12=y01+[0.05*cos(th1),0.05*cos(th1)+0.25*sin(th1),...
0.40*cos(th1)+0.3*sin(th1),...
-0.25*cos(th1)+0.45*sin(th1),...
0.40*cos(th1)+0.6*sin(th1),...
-0.250*cos(th1)+0.75*sin(th1),...
0.40*cos(th1)+0.9*sin(th1),...
0.05*cos(th1)+0.95*sin(th1),...
0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+0.95*sin(th1),...
0.25*cos(th1)+0.9*sin(th1),...
-0.40*cos(th1)+0.75*sin(th1),...
0.25*cos(th1)+0.6*sin(th1),...
-0.40*cos(th1)+0.45*sin(th1),...
0.25*cos(th1)+0.3*sin(th1),...
-0.05*cos(th1)+0.25*sin(th1),...
-0.05*cos(th1)];

x02=2;
y02=0;
th2=pi/2;

xres_21=x02+[0.25*sin(th2),0.25*sin(th2)+1.6*cos(th2),...
-0.25*sin(th2)+1.6*cos(th2),-0.25*sin(th2)];
yres_21=y02+[-0.25*cos(th2),-0.25*cos(th2)+1.6*sin(th2),...
0.25*cos(th2)+1.6*sin(th2),0.25*cos(th2)];

xres_22=x02+[-0.03*sin(th2),-0.03*sin(th2)+0.33*cos(th2),...
-0.25*sin(th2)+0.4*cos(th2),...
0.10*sin(th2)+0.6*cos(th2),...
-0.25*sin(th2)+0.8*cos(th2),...
0.10*sin(th2)+1.0*cos(th2),...

```

```

-0.25*sin(th2)+1.2*cos(th2),...
-0.03*sin(th2)+1.27*cos(th2),...
-0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.27*cos(th2),...
-0.10*sin(th2)+1.2*cos(th2),...
0.25*sin(th2)+1.0*cos(th2),...
-0.10*sin(th2)+0.8*cos(th2),...
0.25*sin(th2)+0.6*cos(th2),...
-0.10*sin(th2)+0.4*cos(th2),...
0.03*sin(th2)+0.33*cos(th2),...
0.03*sin(th2)];
yres_22=y02+[0.03*cos(th2),0.03*cos(th2)+0.33*sin(th2),...
0.25*cos(th2)+0.4*sin(th2),...
-0.10*cos(th2)+0.6*sin(th2),...
0.25*cos(th2)+0.8*sin(th2),...
-0.10*cos(th2)+1.0*sin(th2),...
0.25*cos(th2)+1.2*sin(th2),...
0.03*cos(th2)+1.27*sin(th2),...
0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.27*sin(th2),...
0.10*cos(th2)+1.2*sin(th2),...
-0.25*cos(th2)+1.0*sin(th2),...
0.10*cos(th2)+0.8*sin(th2),...
-0.25*cos(th2)+0.6*sin(th2),...
0.10*cos(th2)+0.4*sin(th2),...
-0.03*cos(th2)+0.33*sin(th2),...
-0.03*cos(th2)];

x03=5;
y03=5;
th3=0;

xres_31=x03+[0.40*sin(th3),0.40*sin(th3)+1.2*cos(th3),...
-0.40*sin(th3)+1.2*cos(th3),-0.40*sin(th3)];
yres_31=y03+[-0.40*cos(th3),-0.40*cos(th3)+1.2*sin(th3),...
0.40*cos(th3)+1.2*sin(th3),0.40*cos(th3)];

xres_32=x03+[-0.05*sin(th3),-0.05*sin(th3)+0.25*cos(th3),...
-0.40*sin(th3)+0.3*cos(th3),...
0.25*sin(th3)+0.45*cos(th3),...
-0.40*sin(th3)+0.6*cos(th3),...
0.25*sin(th3)+0.75*cos(th3),...
-0.40*sin(th3)+0.9*cos(th3),...
-0.05*sin(th3)+0.95*cos(th3),...
-0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+0.95*cos(th3),...
-0.25*sin(th3)+0.9*cos(th3),...
0.40*sin(th3)+0.75*cos(th3),...
-0.25*sin(th3)+0.6*cos(th3),...
0.40*sin(th3)+0.45*cos(th3),...
-0.25*sin(th3)+0.3*cos(th3),...
0.05*sin(th3)+0.25*cos(th3),...
0.05*sin(th3)];
yres_32=y03+[0.05*cos(th3),0.05*cos(th3)+0.25*sin(th3),...
0.40*cos(th3)+0.3*sin(th3),...
-0.25*cos(th3)+0.45*sin(th3),...
0.40*cos(th3)+0.6*sin(th3),...
-0.25*cos(th3)+0.75*sin(th3),...
0.40*cos(th3)+0.9*sin(th3),...
0.05*cos(th3)+0.95*sin(th3),...
0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+0.95*sin(th3),...
0.25*cos(th3)+0.9*sin(th3),...
-0.40*cos(th3)+0.75*sin(th3),...
0.25*cos(th3)+0.6*sin(th3),...
-0.40*cos(th3)+0.45*sin(th3),...
0.25*cos(th3)+0.3*sin(th3),...
-0.05*cos(th3)+0.25*sin(th3),...
-0.05*cos(th3)];

x04=-8;

```

```

y04=0;

xv1_1=x04+[-1.0,1.0,1.0,-1.0];
yV1_1=y04+[-0.05,-0.05,0.05,0.05]-0.1;

xv1_2=x04+[-0.4,0.4,0.4,-0.4];
yV1_2=y04+[-0.1,-0.1,0.1,0.1]+0.3;

x05=-1;
y05=5;

xV2_1=x05+[-0.032,0.032,0.032,-0.032]+0.1;
yV2_1=y05+[-1.5,-1.5,1.5,1.5];

xV2_2=x05+[-0.05,0.05,0.05,-0.05]-0.2;
yV2_2=y05+[-0.75,-0.75,0.75,0.75];

xcable1=[-8,-8,-5,-5];
ycable1=y01+[0.1,-0.1,-0.1,0.1];

xcable2=[-8.05,-7.95,-7.95,-8.05];
ycable2=[y01+0.1,y01+0.1,y04-0.15,y04-0.15];

xcable3=[-8.05,-7.95,-7.95,-8.05];
ycable3=[y04-0.15,y04-0.15,-5.0,-5.0];

xcable4=[-8,-8,9,9];
ycable4=-5.0+[0.1,-0.1,-0.1,0.1];

xcable5=[-3.8,-3.8,-1.25,-1.25];
ycable5=y01+[0.1,-0.1,-0.1,0.1];

xcable6=[-1.25,-1.25,5,5];
ycable6=y01+[0.1,-0.1,-0.1,0.1];

xcable7=[6.2,6.2,9,9];
ycable7=y01+[0.1,-0.1,-0.1,0.1];

xcable8=[-8.05,-7.95,-7.95,-8.05]+10;
ycable8=[y01+0.1,y01+0.1,y02+1.6,y02+1.6];

xcable9=[-8.05,-7.95,-7.95,-8.05]+10;
ycable9=[-4.9,-4.9,y02,y02];
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_11,yres_11,[1.0,1.0,1.0],...
xres_12,yres_12,[0.0,0.0,0.0],...
xres_21,yres_21,[1.0,1.0,1.0],...
xres_22,yres_22,[0.0,0.0,0.0],...
xres_31,yres_31,[1.0,1.0,1.0],...
xres_32,yres_32,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
'LineStyle','None')

text(-11,11,'Η αντίσταση Thevenin ισούται με την αντίσταση που φαίνεται από τα άκρα a, b.')
text(-4.5,6.5,'R_1','Color',[0.9,0.2,0.0])
text(2.5,0.7,'R_2','Color',[0.9,0.2,0.0])
text(5.5,6.5,'R_3','Color',[0.9,0.2,0.0])
text(9.5,5.0,'a','Color',[0.9,0.0,0.9])
text(9.5,-5.0,'b','Color',[0.9,0.0,0.9])

axis([-12,12,-12,12])
axis off;

elseif (snmeio==3)
axes(handles.axes1);
cla

x_back=[-12,12,12,-12];

```

```

y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,9,9];

x01=-5;
y01=5;
th1=0;

xres_11=x01+[0.40*sin(th1),0.40*sin(th1)+1.2*cos(th1),...
-0.40*sin(th1)+1.2*cos(th1),-0.40*sin(th1)];
yres_11=y01+[-0.40*cos(th1),-0.40*cos(th1)+1.2*sin(th1),...
0.40*cos(th1)+1.2*sin(th1),0.40*cos(th1)];

xres_12=x01+[-0.05*sin(th1),-0.05*sin(th1)+0.25*cos(th1),...
-0.40*sin(th1)+0.3*cos(th1),...
0.25*sin(th1)+0.45*cos(th1),...
-0.40*sin(th1)+0.6*cos(th1),...
0.25*sin(th1)+0.75*cos(th1),...
-0.40*sin(th1)+0.9*cos(th1),...
-0.05*sin(th1)+0.95*cos(th1),...
-0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+0.95*cos(th1),...
-0.25*sin(th1)+0.9*cos(th1),...
0.40*sin(th1)+0.75*cos(th1),...
-0.25*sin(th1)+0.6*cos(th1),...
0.40*sin(th1)+0.45*cos(th1),...
-0.25*sin(th1)+0.3*cos(th1),...
0.05*sin(th1)+0.25*cos(th1),...
0.05*sin(th1)];
yres_12=y01+[0.05*cos(th1),0.05*cos(th1)+0.25*sin(th1),...
0.40*cos(th1)+0.3*sin(th1),...
-0.25*cos(th1)+0.45*sin(th1),...
0.40*cos(th1)+0.6*sin(th1),...
-0.25*cos(th1)+0.75*sin(th1),...
0.40*cos(th1)+0.9*sin(th1),...
0.05*cos(th1)+0.95*sin(th1),...
0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+0.95*sin(th1),...
0.25*cos(th1)+0.9*sin(th1),...
-0.40*cos(th1)+0.75*sin(th1),...
0.25*cos(th1)+0.6*sin(th1),...
-0.40*cos(th1)+0.45*sin(th1),...
0.25*cos(th1)+0.3*sin(th1),...
-0.05*cos(th1)+0.25*sin(th1),...
-0.05*cos(th1)];

x02=2;
y02=0;
th2=pi/2;

xres_21=x02+[0.25*sin(th2),0.25*sin(th2)+1.6*cos(th2),...
-0.25*sin(th2)+1.6*cos(th2),-0.25*sin(th2)];
yres_21=y02+[-0.25*cos(th2),-0.25*cos(th2)+1.6*sin(th2),...
0.25*cos(th2)+1.6*sin(th2),0.25*cos(th2)];

xres_22=x02+[-0.03*sin(th2),-0.03*sin(th2)+0.33*cos(th2),...
-0.25*sin(th2)+0.4*cos(th2),...
0.10*sin(th2)+0.6*cos(th2),...
-0.25*sin(th2)+0.8*cos(th2),...
0.10*sin(th2)+1.0*cos(th2),...
-0.25*sin(th2)+1.2*cos(th2),...
-0.03*sin(th2)+1.27*cos(th2),...
-0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.27*cos(th2),...
-0.10*sin(th2)+1.2*cos(th2),...
0.25*sin(th2)+1.0*cos(th2),...
-0.10*sin(th2)+0.8*cos(th2),...
0.25*sin(th2)+0.6*cos(th2),...
-0.10*sin(th2)+0.4*cos(th2),...
0.03*sin(th2)+0.33*cos(th2),...
0.03*sin(th2)];
yres_22=y02+[0.03*cos(th2),0.03*cos(th2)+0.33*sin(th2),...
0.25*cos(th2)+0.4*sin(th2),...
-0.10*cos(th2)+0.6*sin(th2),...
0.25*cos(th2)+0.8*sin(th2),...

```

```

-0.10*cos(th2)+1.0*sin(th2),...
0.25*cos(th2)+1.2*sin(th2),...
0.03*cos(th2)+1.27*sin(th2),...
0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.27*sin(th2),...
0.10*cos(th2)+1.2*sin(th2),...
-0.25*cos(th2)+1.0*sin(th2),...
0.10*cos(th2)+0.8*sin(th2),...
-0.25*cos(th2)+0.6*sin(th2),...
0.10*cos(th2)+0.4*sin(th2),...
-0.03*cos(th2)+0.33*sin(th2),...
-0.03*cos(th2)];

x03=5;
y03=5;
th3=0;

xres_31=x03+[0.40*sin(th3),0.40*sin(th3)+1.2*cos(th3),...
-0.40*sin(th3)+1.2*cos(th3),-0.40*sin(th3)];
yres_31=y03+[-0.40*cos(th3),-0.40*cos(th3)+1.2*sin(th3),...
0.40*cos(th3)+1.2*sin(th3),0.40*cos(th3)];

xres_32=x03+[-0.05*sin(th3),-0.05*sin(th3)+0.25*cos(th3),...
-0.40*sin(th3)+0.3*cos(th3),...
0.25*sin(th3)+0.45*cos(th3),...
-0.40*sin(th3)+0.6*cos(th3),...
0.25*sin(th3)+0.75*cos(th3),...
-0.40*sin(th3)+0.9*cos(th3),...
-0.05*sin(th3)+0.95*cos(th3),...
-0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+0.95*cos(th3),...
-0.25*sin(th3)+0.9*cos(th3),...
0.40*sin(th3)+0.75*cos(th3),...
-0.25*sin(th3)+0.6*cos(th3),...
0.40*sin(th3)+0.45*cos(th3),...
-0.25*sin(th3)+0.3*cos(th3),...
0.05*sin(th3)+0.25*cos(th3),...
0.05*sin(th3)];
yres_32=y03+[0.05*cos(th3),0.05*cos(th3)+0.25*sin(th3),...
0.40*cos(th3)+0.3*sin(th3),...
-0.25*cos(th3)+0.45*sin(th3),...
0.40*cos(th3)+0.6*sin(th3),...
-0.250*cos(th3)+0.75*sin(th3),...
0.40*cos(th3)+0.9*sin(th3),...
0.05*cos(th3)+0.95*sin(th3),...
0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+0.95*sin(th3),...
0.25*cos(th3)+0.9*sin(th3),...
-0.40*cos(th3)+0.75*sin(th3),...
0.25*cos(th3)+0.6*sin(th3),...
-0.40*cos(th3)+0.45*sin(th3),...
0.25*cos(th3)+0.3*sin(th3),...
-0.05*cos(th3)+0.25*sin(th3),...
-0.05*cos(th3)];

x04=-8;
y04=0;

xv1_1=x04+[-1.0,1.0,1.0,-1.0];
yv1_1=y04+[-0.05,-0.05,0.05,0.05]-0.1;

xv1_2=x04+[-0.4,0.4,0.4,-0.4];
yv1_2=y04+[-0.1,-0.1,0.1,0.1]+0.3;

x05=-1;
y05=5;

xv2_1=x05+[-0.032,0.032,0.032,-0.032]+0.1;
yv2_1=y05+[-1.5,-1.5,1.5,1.5];

xv2_2=x05+[-0.05,0.05,0.05,-0.05]-0.2;

```

```

yV2_2=y05+[-0.75,-0.75,0.75,0.75];

xcable1=[-8,-8,-5,-5];
ycable1=y01+[0.1,-0.1,-0.1,0.1];

xcable2=[-8.05,-7.95,-7.95,-8.05];
ycable2=[y01+0.1,y01+0.1,y04+0.4,y04+0.4];

xcable3=[-8.05,-7.95,-7.95,-8.05];
ycable3=[y04-0.15,y04-0.15,-5.0,-5.0];

xcable4=[-8,-8,9,9];
ycable4=-5.0+[0.1,-0.1,-0.1,0.1];

xcable5=[-3.8,-3.8,-1.25,-1.25];
ycable5=y01+[0.1,-0.1,-0.1,0.1];

xcable6=[-1.25,-1.25,5,5];
ycable6=y01+[0.1,-0.1,-0.1,0.1];

xcable7=[5,5,9,9];
ycable7=y01+[0.1,-0.1,-0.1,0.1];

xcable8=[-8.05,-7.95,-7.95,-8.05]+10;
ycable8=[y01+0.1,y01+0.1,y02+1.6,y02+1.6];

xcable9=[-8.05,-7.95,-7.95,-8.05]+10;
ycable9=[-4.9,-4.9,y02,y02];
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_11,yres_11,[1.0,1.0,1.0],...
xres_12,yres_12,[0.0,0.0,0.0],...
xV1_1,yV1_1,[0.0,0.0,0.0],...
xV1_2,yV1_2,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
'LineStyle','None')

text(-11,11,'To ισοδύναμο κατά Thevenin κύκλωμα έχει τα στοιχεία')
text(3,11,'V_T=')
text(4,11,nVT)
text(5.5,11,'Volts')
text(3,10,'R_T=')
text(4,10,nRT)
text(5.5,10,'Ohm')
text(-4.5,6.5,'R_T','Color',[0.9,0.2,0.0])
text(-9.5,0.5,'V_T','Color',[0.0,0.2,0.9])
text(9.5,5.0,'a','Color',[0.9,0.0,0.9])
text(9.5,-5.0,'b','Color',[0.9,0.0,0.9])

axis([-12,12,-12,12])
axis off;

else
end

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

% --- Executes on button press in pushbutton3.
function pushbutton3_Callback(hObject, eventdata, handles)
% hObject handle to pushbutton3 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

global R1;
global R2;
global R3;
global V1;
global V2;

global snmeio;

```

```

snmeio=snmeio-1;

if (snmeio==0)
    snmeio=3;
end

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
RT=R1*R2/(R1+R2)+R3;
VT=R2*(V1-V2)/(R1+R2);
nRT=num2str(0.01*round(100*RT));
nVT=num2str(0.01*round(100*VT));
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

if (snmeio==1)
    axes(handles.axes1);
    cla

    x_back=[-12,12,12,-12];
    y_back=[-12,-12,12,12];

    x_tableau=[-11,11,11,-11];
    y_tableau=[-11,-11,9,9];

    x01=-5;
    y01=5;
    th1=0;

    xres_11=x01+[0.40*sin(th1),0.40*sin(th1)+1.2*cos(th1),...
        -0.40*sin(th1)+1.2*cos(th1),-0.40*sin(th1)];
    yres_11=y01+[-0.40*cos(th1),-0.40*cos(th1)+1.2*sin(th1),...
        0.40*cos(th1)+1.2*sin(th1),0.40*cos(th1)];

    xres_12=x01+[-0.05*sin(th1),-0.05*sin(th1)+0.25*cos(th1),...
        -0.40*sin(th1)+0.3*cos(th1),...
        0.25*sin(th1)+0.45*cos(th1),...
        -0.40*sin(th1)+0.6*cos(th1),...
        0.25*sin(th1)+0.75*cos(th1),...
        -0.40*sin(th1)+0.9*cos(th1),...
        -0.05*sin(th1)+0.95*cos(th1),...
        -0.05*sin(th1)+1.2*cos(th1),...
        0.05*sin(th1)+1.2*cos(th1),...
        0.05*sin(th1)+0.95*cos(th1),...
        -0.25*sin(th1)+0.9*cos(th1),...
        0.40*sin(th1)+0.75*cos(th1),...
        -0.25*sin(th1)+0.6*cos(th1),...
        0.40*sin(th1)+0.45*cos(th1),...
        -0.25*sin(th1)+0.3*cos(th1),...
        0.05*sin(th1)+0.25*cos(th1),...
        0.05*sin(th1)];
    yres_12=y01+[0.05*cos(th1),0.05*cos(th1)+0.25*sin(th1),...
        0.40*cos(th1)+0.3*sin(th1),...
        -0.25*cos(th1)+0.45*sin(th1),...
        0.40*cos(th1)+0.6*sin(th1),...
        -0.25*cos(th1)+0.75*sin(th1),...
        0.40*cos(th1)+0.9*sin(th1),...
        0.05*cos(th1)+0.95*sin(th1),...
        0.05*cos(th1)+1.2*sin(th1),...
        -0.05*cos(th1)+1.2*sin(th1),...
        -0.05*cos(th1)+0.95*sin(th1),...
        0.25*cos(th1)+0.9*sin(th1),...
        -0.40*cos(th1)+0.75*sin(th1),...
        0.25*cos(th1)+0.6*sin(th1),...
        -0.40*cos(th1)+0.45*sin(th1),...
        0.25*cos(th1)+0.3*sin(th1),...
        -0.05*cos(th1)+0.25*sin(th1),...
        -0.05*cos(th1)];

    x02=2;
    y02=0;
    th2=pi/2;

    xres_21=x02+[0.25*sin(th2),0.25*sin(th2)+1.6*cos(th2),...
        -0.25*sin(th2)+1.6*cos(th2),-0.25*sin(th2)];
    yres_21=y02+[-0.25*cos(th2),-0.25*cos(th2)+1.6*sin(th2),...
        0.25*cos(th2)+1.6*sin(th2),0.25*cos(th2)];

    xres_22=x02+[-0.03*sin(th2),-0.03*sin(th2)+0.33*cos(th2),...
        -0.25*sin(th2)+0.4*cos(th2),...

```



```

0.10*sin(th2)+0.6*cos(th2),...
-0.25*sin(th2)+0.8*cos(th2),...
0.10*sin(th2)+1.0*cos(th2),...
-0.25*sin(th2)+1.2*cos(th2),...
-0.03*sin(th2)+1.27*cos(th2),...
-0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.27*cos(th2),...
-0.10*sin(th2)+1.2*cos(th2),...
0.25*sin(th2)+1.0*cos(th2),...
-0.10*sin(th2)+0.8*cos(th2),...
0.25*sin(th2)+0.6*cos(th2),...
-0.10*sin(th2)+0.4*cos(th2),...
0.03*sin(th2)+0.33*cos(th2),...
0.03*sin(th2)];
yres_22=y02+[0.03*cos(th2),0.03*cos(th2)+0.33*sin(th2),...
0.25*cos(th2)+0.4*sin(th2),...
-0.10*cos(th2)+0.6*sin(th2),...
0.25*cos(th2)+0.8*sin(th2),...
-0.10*cos(th2)+1.0*sin(th2),...
0.25*cos(th2)+1.2*sin(th2),...
0.03*cos(th2)+1.27*sin(th2),...
0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.27*sin(th2),...
0.10*cos(th2)+1.2*sin(th2),...
-0.25*cos(th2)+1.0*sin(th2),...
0.10*cos(th2)+0.8*sin(th2),...
-0.25*cos(th2)+0.6*sin(th2),...
0.10*cos(th2)+0.4*sin(th2),...
-0.03*cos(th2)+0.33*sin(th2),...
-0.03*cos(th2)];

x03=5;
y03=5;
th3=0;

xres_31=x03+[0.40*sin(th3),0.40*sin(th3)+1.2*cos(th3),...
-0.40*sin(th3)+1.2*cos(th3),-0.40*sin(th3)];
yres_31=y03+[-0.40*cos(th3),-0.40*cos(th3)+1.2*sin(th3),...
0.40*cos(th3)+1.2*sin(th3),0.40*cos(th3)];

xres_32=x03+[-0.05*sin(th3),-0.05*sin(th3)+0.25*cos(th3),...
-0.40*sin(th3)+0.3*cos(th3),...
0.25*sin(th3)+0.45*cos(th3),...
-0.40*sin(th3)+0.6*cos(th3),...
0.25*sin(th3)+0.75*cos(th3),...
-0.40*sin(th3)+0.9*cos(th3),...
-0.05*sin(th3)+0.95*cos(th3),...
-0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+0.95*cos(th3),...
-0.25*sin(th3)+0.9*cos(th3),...
0.40*sin(th3)+0.75*cos(th3),...
-0.25*sin(th3)+0.6*cos(th3),...
0.40*sin(th3)+0.45*cos(th3),...
-0.25*sin(th3)+0.3*cos(th3),...
0.05*sin(th3)+0.25*cos(th3),...
0.05*sin(th3)];
yres_32=y03+[0.05*cos(th3),0.05*cos(th3)+0.25*sin(th3),...
0.40*cos(th3)+0.3*sin(th3),...
-0.25*cos(th3)+0.45*sin(th3),...
0.40*cos(th3)+0.6*sin(th3),...
-0.25*cos(th3)+0.75*sin(th3),...
0.40*cos(th3)+0.9*sin(th3),...
0.05*cos(th3)+0.95*sin(th3),...
0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+0.95*sin(th3),...
0.25*cos(th3)+0.9*sin(th3),...
-0.40*cos(th3)+0.75*sin(th3),...
0.25*cos(th3)+0.6*sin(th3),...
-0.40*cos(th3)+0.45*sin(th3),...
0.25*cos(th3)+0.3*sin(th3),...
-0.05*cos(th3)+0.25*sin(th3),...
-0.05*cos(th3)];

```



```

text(9.5,5.0,'a','Color',[0.9,0.0,0.9])
text(9.5,-5.0,'b','Color',[0.9,0.0,0.9])

axis([-12,12,-12,12])
axis off;

elseif (snmeio==2)

axes(handles.axes1);
cla

x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,9,9];

x01=-5;
y01=5;
th1=0;

xres_11=x01+[0.40*sin(th1),0.40*sin(th1)+1.2*cos(th1),...
-0.40*sin(th1)+1.2*cos(th1),-0.40*sin(th1)];
yres_11=y01+[-0.40*cos(th1),-0.40*cos(th1)+1.2*sin(th1),...
0.40*cos(th1)+1.2*sin(th1),0.40*cos(th1)];

xres_12=x01+[-0.05*sin(th1),-0.05*sin(th1)+0.25*cos(th1),...
-0.40*sin(th1)+0.3*cos(th1),...
0.25*sin(th1)+0.45*cos(th1),...
-0.40*sin(th1)+0.6*cos(th1),...
0.25*sin(th1)+0.75*cos(th1),...
-0.40*sin(th1)+0.9*cos(th1),...
-0.05*sin(th1)+0.95*cos(th1),...
-0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+0.95*cos(th1),...
-0.25*sin(th1)+0.9*cos(th1),...
0.40*sin(th1)+0.75*cos(th1),...
-0.25*sin(th1)+0.6*cos(th1),...
0.40*sin(th1)+0.45*cos(th1),...
-0.25*sin(th1)+0.3*cos(th1),...
0.05*sin(th1)+0.25*cos(th1),...
0.05*sin(th1)];
yres_12=y01+[0.05*cos(th1),0.05*cos(th1)+0.25*sin(th1),...
0.40*cos(th1)+0.3*sin(th1),...
-0.25*cos(th1)+0.45*sin(th1),...
0.40*cos(th1)+0.6*sin(th1),...
-0.250*cos(th1)+0.75*sin(th1),...
0.40*cos(th1)+0.9*sin(th1),...
0.05*cos(th1)+0.95*sin(th1),...
0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+0.95*sin(th1),...
0.25*cos(th1)+0.9*sin(th1),...
-0.40*cos(th1)+0.75*sin(th1),...
0.25*cos(th1)+0.6*sin(th1),...
-0.40*cos(th1)+0.45*sin(th1),...
0.25*cos(th1)+0.3*sin(th1),...
-0.05*cos(th1)+0.25*sin(th1),...
-0.05*cos(th1)];

x02=2;
y02=0;
th2=pi/2;

xres_21=x02+[0.25*sin(th2),0.25*sin(th2)+1.6*cos(th2),...
-0.25*sin(th2)+1.6*cos(th2),-0.25*sin(th2)];
yres_21=y02+[-0.25*cos(th2),-0.25*cos(th2)+1.6*sin(th2),...
0.25*cos(th2)+1.6*sin(th2),0.25*cos(th2)];

xres_22=x02+[-0.03*sin(th2),-0.03*sin(th2)+0.33*cos(th2),...
-0.25*sin(th2)+0.4*cos(th2),...
0.10*sin(th2)+0.6*cos(th2),...
-0.25*sin(th2)+0.8*cos(th2),...
0.10*sin(th2)+1.0*cos(th2),...
-0.25*sin(th2)+1.2*cos(th2),...
-0.03*sin(th2)+1.27*cos(th2),...

```

```

-0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.27*cos(th2),...
-0.10*sin(th2)+1.2*cos(th2),...
0.25*sin(th2)+1.0*cos(th2),...
-0.10*sin(th2)+0.8*cos(th2),...
0.25*sin(th2)+0.6*cos(th2),...
-0.10*sin(th2)+0.4*cos(th2),...
0.03*sin(th2)+0.33*cos(th2),...
0.03*sin(th2)];
yres_22=y02+[0.03*cos(th2),0.03*cos(th2)+0.33*sin(th2),...
0.25*cos(th2)+0.4*sin(th2),...
-0.10*cos(th2)+0.6*sin(th2),...
0.25*cos(th2)+0.8*sin(th2),...
-0.10*cos(th2)+1.0*sin(th2),...
0.25*cos(th2)+1.2*sin(th2),...
0.03*cos(th2)+1.27*sin(th2),...
0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.27*sin(th2),...
0.10*cos(th2)+1.2*sin(th2),...
-0.25*cos(th2)+1.0*sin(th2),...
0.10*cos(th2)+0.8*sin(th2),...
-0.25*cos(th2)+0.6*sin(th2),...
0.10*cos(th2)+0.4*sin(th2),...
-0.03*cos(th2)+0.33*sin(th2),...
-0.03*cos(th2)];

x03=5;
y03=5;
th3=0;

xres_31=x03+[0.40*sin(th3),0.40*sin(th3)+1.2*cos(th3),...
-0.40*sin(th3)+1.2*cos(th3),-0.40*sin(th3)];
yres_31=y03+[-0.40*cos(th3),-0.40*cos(th3)+1.2*sin(th3),...
0.40*cos(th3)+1.2*sin(th3),0.40*cos(th3)];

xres_32=x03+[-0.05*sin(th3),-0.05*sin(th3)+0.25*cos(th3),...
-0.40*sin(th3)+0.3*cos(th3),...
0.25*sin(th3)+0.45*cos(th3),...
-0.40*sin(th3)+0.6*cos(th3),...
0.25*sin(th3)+0.75*cos(th3),...
-0.40*sin(th3)+0.9*cos(th3),...
-0.05*sin(th3)+0.95*cos(th3),...
-0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+0.95*cos(th3),...
-0.25*sin(th3)+0.9*cos(th3),...
0.40*sin(th3)+0.75*cos(th3),...
-0.25*sin(th3)+0.6*cos(th3),...
0.40*sin(th3)+0.45*cos(th3),...
-0.25*sin(th3)+0.3*cos(th3),...
0.05*sin(th3)+0.25*cos(th3),...
0.05*sin(th3)];
yres_32=y03+[0.05*cos(th3),0.05*cos(th3)+0.25*sin(th3),...
0.40*cos(th3)+0.3*sin(th3),...
-0.25*cos(th3)+0.45*sin(th3),...
0.40*cos(th3)+0.6*sin(th3),...
-0.25*cos(th3)+0.75*sin(th3),...
0.40*cos(th3)+0.9*sin(th3),...
0.05*cos(th3)+0.95*sin(th3),...
0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+0.95*sin(th3),...
0.25*cos(th3)+0.9*sin(th3),...
-0.40*cos(th3)+0.75*sin(th3),...
0.25*cos(th3)+0.6*sin(th3),...
-0.40*cos(th3)+0.45*sin(th3),...
0.25*cos(th3)+0.3*sin(th3),...
-0.05*cos(th3)+0.25*sin(th3),...
-0.05*cos(th3)];

x04=-8;
y04=0;

```

```

xv1_1=x04+[-1.0,1.0,1.0,-1.0];
yv1_1=y04+[-0.05,-0.05,0.05,0.05]-0.1;

xv1_2=x04+[-0.4,0.4,0.4,-0.4];
yv1_2=y04+[-0.1,-0.1,0.1,0.1]+0.3;

x05=-1;
y05=5;

xv2_1=x05+[-0.032,0.032,0.032,-0.032]+0.1;
yv2_1=y05+[-1.5,-1.5,1.5,1.5];

xv2_2=x05+[-0.05,0.05,0.05,-0.05]-0.2;
yv2_2=y05+[-0.75,-0.75,0.75,0.75];

xcable1=[-8,-8,-5,-5];
ycable1=y01+[0.1,-0.1,-0.1,0.1];

xcable2=[-8.05,-7.95,-7.95,-8.05];
ycable2=[y01+0.1,y01+0.1,y04-0.15,y04-0.15];

xcable3=[-8.05,-7.95,-7.95,-8.05];
ycable3=[y04-0.15,y04-0.15,-5.0,-5.0];

xcable4=[-8,-8,9,9];
ycable4=-5.0+[0.1,-0.1,-0.1,0.1];

xcable5=[-3.8,-3.8,-1.25,-1.25];
ycable5=y01+[0.1,-0.1,-0.1,0.1];

xcable6=[-1.25,-1.25,5,5];
ycable6=y01+[0.1,-0.1,-0.1,0.1];

xcable7=[6.2,6.2,9,9];
ycable7=y01+[0.1,-0.1,-0.1,0.1];

xcable8=[-8.05,-7.95,-7.95,-8.05]+10;
ycable8=[y01+0.1,y01+0.1,y02+1.6,y02+1.6];

xcable9=[-8.05,-7.95,-7.95,-8.05]+10;
ycable9=[-4.9,-4.9,y02,y02];
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_11,yres_11,[1.0,1.0,1.0],...
xres_12,yres_12,[0.0,0.0,0.0],...
xres_21,yres_21,[1.0,1.0,1.0],...
xres_22,yres_22,[0.0,0.0,0.0],...
xres_31,yres_31,[1.0,1.0,1.0],...
xres_32,yres_32,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
'Linestyle','None')

text(-11,11,'Η αντίσταση Thevenin ισούται με την αντίσταση που φαίνεται από τα άκρα a, b.')
text(-4.5,6.5,'R_1','Color',[0.9,0.2,0.0])
text(2.5,0.7,'R_2','Color',[0.9,0.2,0.0])
text(5.5,6.5,'R_3','Color',[0.9,0.2,0.0])
text(9.5,5.0,'a','Color',[0.9,0.0,0.9])
text(9.5,-5.0,'b','Color',[0.9,0.0,0.9])

axis([-12,12,-12,12])
axis off;

elseif (snmeio==3)
axes(handles.axes1);
cla

x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

```

```

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,9,9];

x01=-5;
y01=5;
th1=0;

xres_11=x01+[0.40*sin(th1),0.40*sin(th1)+1.2*cos(th1),...
-0.40*sin(th1)+1.2*cos(th1),-0.40*sin(th1)];
yres_11=y01+[-0.40*cos(th1),-0.40*cos(th1)+1.2*sin(th1),...
0.40*cos(th1)+1.2*sin(th1),0.40*cos(th1)];

xres_12=x01+[-0.05*sin(th1),-0.05*sin(th1)+0.25*cos(th1),...
-0.40*sin(th1)+0.3*cos(th1),...
0.25*sin(th1)+0.45*cos(th1),...
-0.40*sin(th1)+0.6*cos(th1),...
0.25*sin(th1)+0.75*cos(th1),...
-0.40*sin(th1)+0.9*cos(th1),...
-0.05*sin(th1)+0.95*cos(th1),...
-0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+0.95*cos(th1),...
-0.25*sin(th1)+0.9*cos(th1),...
0.40*sin(th1)+0.75*cos(th1),...
-0.25*sin(th1)+0.6*cos(th1),...
0.40*sin(th1)+0.45*cos(th1),...
-0.25*sin(th1)+0.3*cos(th1),...
0.05*sin(th1)+0.25*cos(th1),...
0.05*sin(th1)];
yres_12=y01+[0.05*cos(th1),0.05*cos(th1)+0.25*sin(th1),...
0.40*cos(th1)+0.3*sin(th1),...
-0.25*cos(th1)+0.45*sin(th1),...
0.40*cos(th1)+0.6*sin(th1),...
-0.250*cos(th1)+0.75*sin(th1),...
0.40*cos(th1)+0.9*sin(th1),...
0.05*cos(th1)+0.95*sin(th1),...
0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+0.95*sin(th1),...
0.25*cos(th1)+0.9*sin(th1),...
-0.40*cos(th1)+0.75*sin(th1),...
0.25*cos(th1)+0.6*sin(th1),...
-0.40*cos(th1)+0.45*sin(th1),...
0.25*cos(th1)+0.3*sin(th1),...
-0.05*cos(th1)+0.25*sin(th1),...
-0.05*cos(th1)];

x02=2;
y02=0;
th2=pi/2;

xres_21=x02+[0.25*sin(th2),0.25*sin(th2)+1.6*cos(th2),...
-0.25*sin(th2)+1.6*cos(th2),-0.25*sin(th2)];
yres_21=y02+[-0.25*cos(th2),-0.25*cos(th2)+1.6*sin(th2),...
0.25*cos(th2)+1.6*sin(th2),0.25*cos(th2)];

xres_22=x02+[-0.03*sin(th2),-0.03*sin(th2)+0.33*cos(th2),...
-0.25*sin(th2)+0.4*cos(th2),...
0.10*sin(th2)+0.6*cos(th2),...
-0.25*sin(th2)+0.8*cos(th2),...
0.10*sin(th2)+1.0*cos(th2),...
-0.25*sin(th2)+1.2*cos(th2),...
-0.03*sin(th2)+1.27*cos(th2),...
-0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.27*cos(th2),...
-0.10*sin(th2)+1.2*cos(th2),...
0.25*sin(th2)+1.0*cos(th2),...
-0.10*sin(th2)+0.8*cos(th2),...
0.25*sin(th2)+0.6*cos(th2),...
-0.10*sin(th2)+0.4*cos(th2),...
0.03*sin(th2)+0.33*cos(th2),...
0.03*sin(th2)];
yres_22=y02+[0.03*cos(th2),0.03*cos(th2)+0.33*sin(th2),...
0.25*cos(th2)+0.4*sin(th2),...
-0.10*cos(th2)+0.6*sin(th2),...
0.25*cos(th2)+0.8*sin(th2),...
-0.10*cos(th2)+1.0*sin(th2),...
0.25*cos(th2)+1.2*sin(th2),...

```

```

0.03*cos(th2)+1.27*sin(th2),...
0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.27*sin(th2),...
0.10*cos(th2)+1.2*sin(th2),...
-0.25*cos(th2)+1.0*sin(th2),...
0.10*cos(th2)+0.8*sin(th2),...
-0.25*cos(th2)+0.6*sin(th2),...
0.10*cos(th2)+0.4*sin(th2),...
-0.03*cos(th2)+0.33*sin(th2),...
-0.03*cos(th2)];

x03=5;
y03=5;
th3=0;

xres_31=x03+[0.40*sin(th3),0.40*sin(th3)+1.2*cos(th3),...
-0.40*sin(th3)+1.2*cos(th3),-0.40*sin(th3)];
yres_31=y03+[-0.40*cos(th3),-0.40*cos(th3)+1.2*sin(th3),...
0.40*cos(th3)+1.2*sin(th3),0.40*cos(th3)];

xres_32=x03+[-0.05*sin(th3),-0.05*sin(th3)+0.25*cos(th3),...
-0.40*sin(th3)+0.3*cos(th3),...
0.25*sin(th3)+0.45*cos(th3),...
-0.40*sin(th3)+0.6*cos(th3),...
0.25*sin(th3)+0.75*cos(th3),...
-0.40*sin(th3)+0.9*cos(th3),...
-0.05*sin(th3)+0.95*cos(th3),...
-0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+0.95*cos(th3),...
-0.25*sin(th3)+0.9*cos(th3),...
0.40*sin(th3)+0.75*cos(th3),...
-0.25*sin(th3)+0.6*cos(th3),...
0.40*sin(th3)+0.45*cos(th3),...
-0.25*sin(th3)+0.3*cos(th3),...
0.05*sin(th3)+0.25*cos(th3),...
0.05*sin(th3)];
yres_32=y03+[0.05*cos(th3),0.05*cos(th3)+0.25*sin(th3),...
0.40*cos(th3)+0.3*sin(th3),...
-0.25*cos(th3)+0.45*sin(th3),...
0.40*cos(th3)+0.6*sin(th3),...
-0.25*cos(th3)+0.75*sin(th3),...
0.40*cos(th3)+0.9*sin(th3),...
0.05*cos(th3)+0.95*sin(th3),...
0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+0.95*sin(th3),...
0.25*cos(th3)+0.9*sin(th3),...
-0.40*cos(th3)+0.75*sin(th3),...
0.25*cos(th3)+0.6*sin(th3),...
-0.40*cos(th3)+0.45*sin(th3),...
0.25*cos(th3)+0.3*sin(th3),...
-0.05*cos(th3)+0.25*sin(th3),...
-0.05*cos(th3)];

x04=-8;
y04=0;

xv1_1=x04+[-1.0,1.0,1.0,-1.0];
yv1_1=y04+[-0.05,-0.05,0.05,0.05]-0.1;

xv1_2=x04+[-0.4,0.4,0.4,-0.4];
yv1_2=y04+[-0.1,-0.1,0.1,0.1]+0.3;

x05=-1;
y05=5;

xv2_1=x05+[-0.032,0.032,0.032,-0.032]+0.1;
yv2_1=y05+[-1.5,-1.5,1.5,1.5];

xv2_2=x05+[-0.05,0.05,0.05,-0.05]-0.2;
yv2_2=y05+[-0.75,-0.75,0.75,0.75];

```

```

        xcable1=[-8,-8,-5,-5];
        ycable1=y01+[0.1,-0.1,-0.1,0.1];

        xcable2=[-8.05,-7.95,-7.95,-8.05];
        ycable2=[y01+0.1,y01+0.1,y04+0.4,y04+0.4];

        xcable3=[-8.05,-7.95,-7.95,-8.05];
        ycable3=[y04-0.15,y04-0.15,-5.0,-5.0];

        xcable4=[-8,-8,9,9];
        ycable4=-5.0+[0.1,-0.1,-0.1,0.1];

        xcable5=[-3.8,-3.8,-1.25,-1.25];
        ycable5=y01+[0.1,-0.1,-0.1,0.1];

        xcable6=[-1.25,-1.25,5,5];
        ycable6=y01+[0.1,-0.1,-0.1,0.1];

        xcable7=[5,5,9,9];
        ycable7=y01+[0.1,-0.1,-0.1,0.1];

        xcable8=[-8.05,-7.95,-7.95,-8.05]+10;
        ycable8=[y01+0.1,y01+0.1,y02+1.6,y02+1.6];

        xcable9=[-8.05,-7.95,-7.95,-8.05]+10;
        ycable9=[-4.9,-4.9,y02,y02];
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

        fill(x_back,y_back,[1.0,1.0,1.0],...
            x_tableau,y_tableau,[0.6,0.6,0.6],...
            xres_11,yres_11,[1.0,1.0,1.0],...
            xres_12,yres_12,[0.0,0.0,0.0],...
            xV1_1,yV1_1,[0.0,0.0,0.0],...
            xV1_2,yV1_2,[0.0,0.0,0.0],...
            xcable1,ycable1,[0.8,0.6,0.2],...
            xcable2,ycable2,[0.8,0.6,0.2],...
            xcable3,ycable3,[0.8,0.6,0.2],...
            xcable4,ycable4,[0.8,0.6,0.2],...
            xcable5,ycable5,[0.8,0.6,0.2],...
            xcable6,ycable6,[0.8,0.6,0.2],...
            xcable7,ycable7,[0.8,0.6,0.2],...
            'LineStyle','None')

        text(-11,11,'Το ισοδύναμο κατά Thevenin κύκλωμα έχει τα στοιχεία')
            text(3,11,'V_T=')
            text(4,11,nVT)
            text(5.5,11,'Volts')
            text(3,10,'R_T=')
            text(4,10,nRT)
            text(5.5,10,'Ohm')
        text(-4.5,6.5,'R_T','Color',[0.9,0.2,0.0])
        text(-9.5,0.5,'V_T','Color',[0.0,0.2,0.9])
        text(9.5,5.0,'a','Color',[0.9,0.0,0.9])
        text(9.5,-5.0,'b','Color',[0.9,0.0,0.9])

        axis([-12,12,-12,12])
        axis off;

    else
    end

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

% --- Executes on button press in pushbutton4.
function pushbutton4_Callback(hObject, eventdata, handles)
% hObject handle to pushbutton4 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)
hfin=questdlg('Εξοδος από το πρόγραμμα?');
switch hfin
case 'Yes'
closereq;
end

```


Ασκηση 2

```
function varargout = g_asknsn_2(varargin)
% G_ASKNSN_2 M-file for g_asknsn_2.fig
% G_ASKNSN_2, by itself, creates a new G_ASKNSN_2 or raises the existing
% singleton*.
%
% H = G_ASKNSN_2 returns the handle to a new G_ASKNSN_2 or the handle to
% the existing singleton*.
%
% G_ASKNSN_2('CALLBACK',hObject,eventData,handles,...) calls the local
% function named CALLBACK in G_ASKNSN_2.M with the given input arguments.
%
% G_ASKNSN_2('Property','Value',...) creates a new G_ASKNSN_2 or raises the
% existing singleton*. Starting from the left, property value pairs are
% applied to the GUI before g_asknsn_2_OpeningFcn gets called. An
% unrecognized property name or invalid value makes property application
% stop. All inputs are passed to g_asknsn_2_OpeningFcn via varargin.
%
% *See GUI Options on GUIDE's Tools menu. Choose "GUI allows only one
% instance to run (singleton)".
%
% See also: GUIDE, GUIDATA, GUIHANDLES

% Edit the above text to modify the response to help g_asknsn_2

% Last Modified by GUIDE v2.5 05-Dec-2013 06:00:57

% Begin initialization code - DO NOT EDIT
gui_Singleton = 1;
gui_State = struct('gui_Name', mfilename, ...
    'gui_Singleton', gui_Singleton, ...
    'gui_OpeningFcn', @g_asknsn_2_OpeningFcn, ...
    'gui_OutputFcn', @g_asknsn_2_OutputFcn, ...
    'gui_LayoutFcn', [], ...
    'gui_Callback', []);
if nargin && ischar(varargin{1})
    gui_State.gui_Callback = str2func(varargin{1});
end

if nargout
    [varargout{1:nargout}] = gui_mainfcn(gui_State, varargin{:});
else
    gui_mainfcn(gui_State, varargin{:});
end
% End initialization code - DO NOT EDIT

% --- Executes just before g_asknsn_2 is made visible.
function g_asknsn_2_OpeningFcn(hObject, eventdata, handles, varargin)
% This function has no output args, see OutputFcn.
% hObject handle to figure
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)
% varargin command line arguments to g_asknsn_2 (see VARARGIN)

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,9,9];

x01=-8;
y01=5;
th1=0;

xres_11=x01+[0.40*sin(th1),0.40*sin(th1)+1.2*cos(th1),...
    -0.40*sin(th1)+1.2*cos(th1),-0.40*sin(th1)];
yres_11=y01+[-0.40*cos(th1),-0.40*cos(th1)+1.2*sin(th1),...
    0.40*cos(th1)+1.2*sin(th1),0.40*cos(th1)];

xres_12=x01+[-0.05*sin(th1),-0.05*sin(th1)+0.25*cos(th1),...
    -0.40*sin(th1)+0.3*cos(th1),...
    0.25*sin(th1)+0.45*cos(th1),...
    -0.40*sin(th1)+0.6*cos(th1),...
    0.25*sin(th1)+0.75*cos(th1),...
    -0.40*sin(th1)+0.9*cos(th1),...
    -0.05*sin(th1)+0.95*cos(th1),...];
```

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-0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+0.95*cos(th1),...
-0.25*sin(th1)+0.9*cos(th1),...
0.40*sin(th1)+0.75*cos(th1),...
-0.25*sin(th1)+0.6*cos(th1),...
0.40*sin(th1)+0.45*cos(th1),...
-0.25*sin(th1)+0.3*cos(th1),...
0.05*sin(th1)+0.25*cos(th1),...
0.05*sin(th1)];
yres_12=y01+[0.05*cos(th1),0.05*cos(th1)+0.25*sin(th1),...
0.40*cos(th1)+0.3*sin(th1),...
-0.25*cos(th1)+0.45*sin(th1),...
0.40*cos(th1)+0.6*sin(th1),...
-0.250*cos(th1)+0.75*sin(th1),...
0.40*cos(th1)+0.9*sin(th1),...
0.05*cos(th1)+0.95*sin(th1),...
0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+0.95*sin(th1),...
0.25*cos(th1)+0.9*sin(th1),...
-0.40*cos(th1)+0.75*sin(th1),...
0.25*cos(th1)+0.6*sin(th1),...
-0.40*cos(th1)+0.45*sin(th1),...
0.25*cos(th1)+0.3*sin(th1),...
-0.05*cos(th1)+0.25*sin(th1),...
-0.05*cos(th1)];

x02=-4;
y02=0;
th2=pi/2;

xres_21=x02+[0.25*sin(th2),0.25*sin(th2)+1.6*cos(th2),...
-0.25*sin(th2)+1.6*cos(th2),-0.25*sin(th2)];
yres_21=y02+[-0.25*cos(th2),-0.25*cos(th2)+1.6*sin(th2),...
0.25*cos(th2)+1.6*sin(th2),0.25*cos(th2)];

xres_22=x02+[-0.03*sin(th2),-0.03*sin(th2)+0.33*cos(th2),...
-0.25*sin(th2)+0.4*cos(th2),...
0.10*sin(th2)+0.6*cos(th2),...
-0.25*sin(th2)+0.8*cos(th2),...
0.10*sin(th2)+1.0*cos(th2),...
-0.25*sin(th2)+1.2*cos(th2),...
-0.03*sin(th2)+1.27*cos(th2),...
-0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.27*cos(th2),...
-0.10*sin(th2)+1.2*cos(th2),...
0.25*sin(th2)+1.0*cos(th2),...
-0.10*sin(th2)+0.8*cos(th2),...
0.25*sin(th2)+0.6*cos(th2),...
-0.10*sin(th2)+0.4*cos(th2),...
0.03*sin(th2)+0.33*cos(th2),...
0.03*sin(th2)];
yres_22=y02+[0.03*cos(th2),0.03*cos(th2)+0.33*sin(th2),...
0.25*cos(th2)+0.4*sin(th2),...
-0.10*cos(th2)+0.6*sin(th2),...
0.25*cos(th2)+0.8*sin(th2),...
-0.10*cos(th2)+1.0*sin(th2),...
0.25*cos(th2)+1.2*sin(th2),...
0.03*cos(th2)+1.27*sin(th2),...
0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.27*sin(th2),...
0.10*cos(th2)+1.2*sin(th2),...
-0.25*cos(th2)+1.0*sin(th2),...
0.10*cos(th2)+0.8*sin(th2),...
-0.25*cos(th2)+0.6*sin(th2),...
0.10*cos(th2)+0.4*sin(th2),...
-0.03*cos(th2)+0.33*sin(th2),...
-0.03*cos(th2)];

x03=-1.5;
y03=5;
th3=0;

xres_31=x03+[0.40*sin(th3),0.40*sin(th3)+1.2*cos(th3),...
-0.40*sin(th3)+1.2*cos(th3),-0.40*sin(th3)];
yres_31=y03+[-0.40*cos(th3),-0.40*cos(th3)+1.2*sin(th3),...

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0.40*cos(th3)+1.2*sin(th3),0.40*cos(th3)];

xres_32=x03+[-0.05*sin(th3),-0.05*sin(th3)+0.25*cos(th3),...
-0.40*sin(th3)+0.3*cos(th3),...
0.25*sin(th3)+0.45*cos(th3),...
-0.40*sin(th3)+0.6*cos(th3),...
0.25*sin(th3)+0.75*cos(th3),...
-0.40*sin(th3)+0.9*cos(th3),...
-0.05*sin(th3)+0.95*cos(th3),...
-0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+0.95*cos(th3),...
-0.25*sin(th3)+0.9*cos(th3),...
0.40*sin(th3)+0.75*cos(th3),...
-0.25*sin(th3)+0.6*cos(th3),...
0.40*sin(th3)+0.45*cos(th3),...
-0.25*sin(th3)+0.3*cos(th3),...
0.05*sin(th3)+0.25*cos(th3),...
0.05*sin(th3)];
yres_32=y03+[0.05*cos(th3),0.05*cos(th3)+0.25*sin(th3),...
0.40*cos(th3)+0.3*sin(th3),...
-0.25*cos(th3)+0.45*sin(th3),...
0.40*cos(th3)+0.6*sin(th3),...
-0.250*cos(th3)+0.75*sin(th3),...
0.40*cos(th3)+0.9*sin(th3),...
0.05*cos(th3)+0.95*sin(th3),...
0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+0.95*sin(th3),...
0.25*cos(th3)+0.9*sin(th3),...
-0.40*cos(th3)+0.75*sin(th3),...
0.25*cos(th3)+0.6*sin(th3),...
-0.40*cos(th3)+0.45*sin(th3),...
0.25*cos(th3)+0.3*sin(th3),...
-0.05*cos(th3)+0.25*sin(th3),...
-0.05*cos(th3)];

x04=3;
y04=5;
th4=0;

xres_41=x04+[0.40*sin(th4),0.40*sin(th4)+1.2*cos(th4),...
-0.40*sin(th4)+1.2*cos(th4),-0.40*sin(th4)];
yres_41=y04+[-0.40*cos(th4),-0.40*cos(th4)+1.2*sin(th4),...
0.40*cos(th4)+1.2*sin(th4),0.40*cos(th4)];

xres_42=x04+[-0.05*sin(th4),-0.05*sin(th4)+0.25*cos(th4),...
-0.40*sin(th4)+0.3*cos(th4),...
0.25*sin(th4)+0.45*cos(th4),...
-0.40*sin(th4)+0.6*cos(th4),...
0.25*sin(th4)+0.75*cos(th4),...
-0.40*sin(th4)+0.9*cos(th4),...
-0.05*sin(th4)+0.95*cos(th4),...
-0.05*sin(th4)+1.2*cos(th4),...
0.05*sin(th4)+1.2*cos(th4),...
0.05*sin(th4)+0.95*cos(th4),...
-0.25*sin(th4)+0.9*cos(th4),...
0.40*sin(th4)+0.75*cos(th4),...
-0.25*sin(th4)+0.6*cos(th4),...
0.40*sin(th4)+0.45*cos(th4),...
-0.25*sin(th4)+0.3*cos(th4),...
0.05*sin(th4)+0.25*cos(th4),...
0.05*sin(th4)];
yres_42=y04+[0.05*cos(th4),0.05*cos(th4)+0.25*sin(th4),...
0.40*cos(th4)+0.3*sin(th4),...
-0.25*cos(th4)+0.45*sin(th4),...
0.40*cos(th4)+0.6*sin(th4),...
-0.250*cos(th4)+0.75*sin(th4),...
0.40*cos(th4)+0.9*sin(th4),...
0.05*cos(th4)+0.95*sin(th4),...
0.05*cos(th4)+1.2*sin(th4),...
-0.05*cos(th4)+1.2*sin(th4),...
-0.05*cos(th4)+0.95*sin(th4),...
0.25*cos(th4)+0.9*sin(th4),...
-0.40*cos(th4)+0.75*sin(th4),...
0.25*cos(th4)+0.6*sin(th4),...
-0.40*cos(th4)+0.45*sin(th4),...
0.25*cos(th4)+0.3*sin(th4),...
-0.05*cos(th4)+0.25*sin(th4),...
-0.05*cos(th4)];

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x05=9;
y05=0;
th5=pi/2;

xres_51=x05+[0.25*sin(th5),0.25*sin(th5)+1.6*cos(th5),...
-0.25*sin(th5)+1.6*cos(th5),-0.25*sin(th5)];
yres_51=y05+[-0.25*cos(th5),-0.25*cos(th5)+1.6*sin(th5),...
0.25*cos(th5)+1.6*sin(th5),0.25*cos(th5)];

xres_52=x05+[-0.03*sin(th5),-0.03*sin(th5)+0.33*cos(th5),...
-0.25*sin(th5)+0.4*cos(th5),...
0.10*sin(th5)+0.6*cos(th5),...
-0.25*sin(th5)+0.8*cos(th5),...
0.10*sin(th5)+1.0*cos(th5),...
-0.25*sin(th5)+1.2*cos(th5),...
-0.03*sin(th5)+1.27*cos(th5),...
-0.03*sin(th5)+1.6*cos(th5),...
0.03*sin(th5)+1.6*cos(th5),...
0.03*sin(th5)+1.27*cos(th5),...
-0.10*sin(th5)+1.2*cos(th5),...
0.25*sin(th5)+1.0*cos(th5),...
-0.10*sin(th5)+0.8*cos(th5),...
0.25*sin(th5)+0.6*cos(th5),...
-0.10*sin(th5)+0.4*cos(th5),...
0.03*sin(th5)+0.33*cos(th5),...
0.03*sin(th5)];
yres_52=y05+[0.03*cos(th5),0.03*cos(th5)+0.33*sin(th5),...
0.25*cos(th5)+0.4*sin(th5),...
-0.10*cos(th5)+0.6*sin(th5),...
0.25*cos(th5)+0.8*sin(th5),...
-0.10*cos(th5)+1.0*sin(th5),...
0.25*cos(th5)+1.2*sin(th5),...
0.03*cos(th5)+1.27*sin(th5),...
0.03*cos(th5)+1.6*sin(th5),...
-0.03*cos(th5)+1.6*sin(th5),...
-0.03*cos(th5)+1.27*sin(th5),...
0.10*cos(th5)+1.2*sin(th5),...
-0.25*cos(th5)+1.0*sin(th5),...
0.10*cos(th5)+0.8*sin(th5),...
-0.25*cos(th5)+0.6*sin(th5),...
0.10*cos(th5)+0.4*sin(th5),...
-0.03*cos(th5)+0.33*sin(th5),...
-0.03*cos(th5)];

x06=-9.5;
y06=0;

xv1_1=x06+[-1.0,1.0,1.0,-1.0];
yv1_1=y06+[-0.05,-0.05,0.05,0.05]+0.3;

xv1_2=x06+[-0.4,0.4,0.4,-0.4];
yv1_2=y06+[-0.1,-0.1,0.1,0.1]-0.1;

x07=1.5;
y07=0;
phi7=0:0.01:2*pi;

xI1_1=x07+0.6*cos(phi7);
yI1_1=y07+0.9*sin(phi7);

xI1_2=x07+0.55*cos(phi7);
yI1_2=y07+0.85*sin(phi7);

xI1_3=x07+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI1_3=y07+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

x08=6.5;
y08=0;
phi8=0:0.01:2*pi;

xI2_1=x08+0.6*cos(phi8);
yI2_1=y08+0.9*sin(phi8);

xI2_2=x08+0.55*cos(phi8);
yI2_2=y08+0.85*sin(phi8);

xI2_3=x08+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI2_3=y08+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

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```

xcable1=[-9.5,-9.5,-8,-8];
ycable1=y01+[0.1,-0.1,-0.1,0.1];

xcable2=[-9.55,-9.45,-9.45,-9.55];
ycable2=[y01+0.1,y01+0.1,y06+0.4,y06+0.4];

xcable3=[-9.55,-9.45,-9.45,-9.55];
ycable3=[y06-0.2,y06-0.2,-5.0,-5.0];

xcable4=[-9.5,-9.5,9,9];
ycable4=-5.0+[0.1,-0.1,-0.1,0.1];

xcable5=[8.95,9.05,9.05,8.95];
ycable5=[-4.9,-4.9,0.0,0.0];

xcable6=[8.95,9.05,9.05,8.95];
ycable6=[4.9,4.9,1.6,1.6];

xcable7=[x04+1.2,x04+1.2,9.05,9.05];
ycable7=y01+[0.1,-0.1,-0.1,0.1];

xcable8=[x04,x04,x03+1.2,x03+1.2];
ycable8=y01+[0.1,-0.1,-0.1,0.1];

xcable9=[x03,x03,x01+1.2,x01+1.2];
ycable9=y01+[0.1,-0.1,-0.1,0.1];

xcable10=[-3.95,-4.05,-4.05,-3.95];
ycable10=[y01+0.1,y01+0.1,y02+1.6,y02+1.6];

xcable11=[-3.95,-4.05,-4.05,-3.95];
ycable11=[-4.9,-4.9,y02,y02];

xcable12=[1.45,1.55,1.55,1.45];
ycable12=[y01+0.1,y01+0.1,y07+0.9,y07+0.9];

xcable13=[1.45,1.55,1.55,1.45];
ycable13=[-4.9,-4.9,y07-0.9,y07-0.9];

xcable14=[1.45,1.55,1.55,1.45]+5.0;
ycable14=[y01+0.1,y01+0.1,y07+0.9,y07+0.9];

xcable15=[1.45,1.55,1.55,1.45]+5.0;
ycable15=[-4.9,-4.9,y07-0.9,y07-0.9];

xcurr=1.0+[-3.95,-3.45,-3.45,-3.25,-3.45,-3.45,-3.95];
ycurr=y01+[0.1,0.1,0.3,0.0,-0.3,-0.1,-0.1];

```

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%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_11,yres_11,[1.0,1.0,1.0],...
xres_12,yres_12,[0.0,0.0,0.0],...
xres_21,yres_21,[1.0,1.0,1.0],...
xres_22,yres_22,[0.0,0.0,0.0],...
xres_31,yres_31,[1.0,1.0,1.0],...
xres_32,yres_32,[0.0,0.0,0.0],...
xres_41,yres_41,[1.0,1.0,1.0],...
xres_42,yres_42,[0.0,0.0,0.0],...
xres_51,yres_51,[1.0,1.0,1.0],...
xres_52,yres_52,[0.0,0.0,0.0],...
xV1_1,yV1_1,[0.0,0.0,0.0],...
xV1_2,yV1_2,[0.0,0.0,0.0],...
xI1_1,yI1_1,[0.0,0.0,0.0],...
xI1_2,yI1_2,[1.0,1.0,1.0],...
xI1_3,yI1_3,[0.0,0.0,0.0],...
xI2_1,yI2_1,[0.0,0.0,0.0],...
xI2_2,yI2_2,[1.0,1.0,1.0],...
xI2_3,yI2_3,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
xcable10,ycable10,[0.8,0.6,0.2],...
xcable11,ycable11,[0.8,0.6,0.2],...

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xcable12,ycable12,[0.8,0.6,0.2],...
xcable13,ycable13,[0.8,0.6,0.2],...
xcable14,ycable14,[0.8,0.6,0.2],...
xcable15,ycable15,[0.8,0.6,0.2],...
xcurr,ycurr,[0.0,0.0,0.0],...
    'Linestyle','None')

text(-11,11,'Με την βοήθεια του θεωρήματος Thevenin να υπολογιστεί το ρεύμα I του παρακάτω κυκλώματος')
text(-7.5,6.5,'R_1','Color',[0.9,0.2,0.0])
text(-5.0,0.7,'R_2','Color',[0.9,0.2,0.0])
text(-1.0,6.5,'R_3','Color',[0.9,0.2,0.0])
text(3.5,6.5,'R_4','Color',[0.9,0.2,0.0])
text(9.5,0.7,'R_5','Color',[0.9,0.2,0.0])
text(-10.5,1.0,'V_1','Color',[0.0,0.2,0.9])
text(0.5,0.0,'I_1','Color',[0.0,0.4,0.4])
text(5.5,0.0,'I_2','Color',[0.0,0.4,0.4])
text(-4.25,5.5,'a','Color',[0.1,0.1,0.1])
text(-4.25,-5.5,'c','Color',[0.1,0.1,0.1])
text(1.25,5.5,'b','Color',[0.1,0.1,0.1])
text(1.25,-5.5,'d','Color',[0.1,0.1,0.1])
text(6.25,5.5,'e','Color',[0.1,0.1,0.1])
text(-2.8,6.0,'I','Color',[0.1,0.1,0.1])

axis([-12,12,-12,12])
axis off;
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

% Choose default command line output for g_asknsn_2
handles.output = hObject;

% Update handles structure
guidata(hObject, handles);

% UIWAIT makes g_asknsn_2 wait for user response (see UIRESUME)
% uiwait(handles.figure1);

% --- Outputs from this function are returned to the command line.
function varargout = g_asknsn_2_OutputFcn(hObject, eventdata, handles)
% varargout cell array for returning output args (see VARARGOUT);
% hObject handle to figure
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

% Get default command line output from handles structure
varargout{1} = handles.output;

function edit1_Callback(hObject, eventdata, handles)
% hObject handle to edit1 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit1 as text
% str2double(get(hObject,'String')) returns contents of edit1 as a double

% --- Executes during object creation, after setting all properties.
function edit1_CreateFcn(hObject, eventdata, handles)
% hObject handle to edit1 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles empty - handles not created until after all CreateFcns called

% Hint: edit controls usually have a white background on Windows.
% See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
set(hObject,'BackgroundColor','white');
end

function edit2_Callback(hObject, eventdata, handles)
% hObject handle to edit2 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit2 as text
% str2double(get(hObject,'String')) returns contents of edit2 as a double

```

```

% --- Executes during object creation, after setting all properties.
function edit2_CreateFcn(hObject, eventdata, handles)
    % hObject    handle to edit2 (see GCBO)
    % eventdata  reserved - to be defined in a future version of MATLAB
    % handles    empty - handles not created until after all CreateFcns called

    % Hint: edit controls usually have a white background on Windows.
    %         See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit3_Callback(hObject, eventdata, handles)
    % hObject    handle to edit3 (see GCBO)
    % eventdata  reserved - to be defined in a future version of MATLAB
    % handles    structure with handles and user data (see GUIDATA)

    % Hints: get(hObject,'String') returns contents of edit3 as text
    % str2double(get(hObject,'String')) returns contents of edit3 as a double

% --- Executes during object creation, after setting all properties.
function edit3_CreateFcn(hObject, eventdata, handles)
    % hObject    handle to edit3 (see GCBO)
    % eventdata  reserved - to be defined in a future version of MATLAB
    % handles    empty - handles not created until after all CreateFcns called

    % Hint: edit controls usually have a white background on Windows.
    %         See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit4_Callback(hObject, eventdata, handles)
    % hObject    handle to edit4 (see GCBO)
    % eventdata  reserved - to be defined in a future version of MATLAB
    % handles    structure with handles and user data (see GUIDATA)

    % Hints: get(hObject,'String') returns contents of edit4 as text
    % str2double(get(hObject,'String')) returns contents of edit4 as a double

% --- Executes during object creation, after setting all properties.
function edit4_CreateFcn(hObject, eventdata, handles)
    % hObject    handle to edit4 (see GCBO)
    % eventdata  reserved - to be defined in a future version of MATLAB
    % handles    empty - handles not created until after all CreateFcns called

    % Hint: edit controls usually have a white background on Windows.
    %         See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit5_Callback(hObject, eventdata, handles)
    % hObject    handle to edit5 (see GCBO)
    % eventdata  reserved - to be defined in a future version of MATLAB
    % handles    structure with handles and user data (see GUIDATA)

    % Hints: get(hObject,'String') returns contents of edit5 as text
    % str2double(get(hObject,'String')) returns contents of edit5 as a double

% --- Executes during object creation, after setting all properties.
function edit5_CreateFcn(hObject, eventdata, handles)
    % hObject    handle to edit5 (see GCBO)
    % eventdata  reserved - to be defined in a future version of MATLAB
    % handles    empty - handles not created until after all CreateFcns called

    % Hint: edit controls usually have a white background on Windows.
    %         See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

```

```

end

function edit6_Callback(hObject, eventdata, handles)
    % hObject    handle to edit6 (see GCBO)
    % eventdata reserved - to be defined in a future version of MATLAB
    % handles    structure with handles and user data (see GUIDATA)

    % Hints: get(hObject,'String') returns contents of edit6 as text
    % str2double(get(hObject,'String')) returns contents of edit6 as a double

    % --- Executes during object creation, after setting all properties.
    function edit6_CreateFcn(hObject, eventdata, handles)
        % hObject    handle to edit6 (see GCBO)
        % eventdata reserved - to be defined in a future version of MATLAB
        % handles    empty - handles not created until after all CreateFcns called

        % Hint: edit controls usually have a white background on Windows.
        %         See ISPC and COMPUTER.
    if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUiControlBackgroundColor'))
        set(hObject,'BackgroundColor','white');
    end

function edit7_Callback(hObject, eventdata, handles)
    % hObject    handle to edit7 (see GCBO)
    % eventdata reserved - to be defined in a future version of MATLAB
    % handles    structure with handles and user data (see GUIDATA)

    % Hints: get(hObject,'String') returns contents of edit7 as text
    % str2double(get(hObject,'String')) returns contents of edit7 as a double

    % --- Executes during object creation, after setting all properties.
    function edit7_CreateFcn(hObject, eventdata, handles)
        % hObject    handle to edit7 (see GCBO)
        % eventdata reserved - to be defined in a future version of MATLAB
        % handles    empty - handles not created until after all CreateFcns called

        % Hint: edit controls usually have a white background on Windows.
        %         See ISPC and COMPUTER.
    if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUiControlBackgroundColor'))
        set(hObject,'BackgroundColor','white');
    end

function edit8_Callback(hObject, eventdata, handles)
    % hObject    handle to edit8 (see GCBO)
    % eventdata reserved - to be defined in a future version of MATLAB
    % handles    structure with handles and user data (see GUIDATA)

    % Hints: get(hObject,'String') returns contents of edit8 as text
    % str2double(get(hObject,'String')) returns contents of edit8 as a double

    % --- Executes during object creation, after setting all properties.
    function edit8_CreateFcn(hObject, eventdata, handles)
        % hObject    handle to edit8 (see GCBO)
        % eventdata reserved - to be defined in a future version of MATLAB
        % handles    empty - handles not created until after all CreateFcns called

        % Hint: edit controls usually have a white background on Windows.
        %         See ISPC and COMPUTER.
    if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUiControlBackgroundColor'))
        set(hObject,'BackgroundColor','white');
    end

    % --- Executes on button press in pushbutton1.
    function pushbutton1_Callback(hObject, eventdata, handles)
        % hObject    handle to pushbutton1 (see GCBO)
        % eventdata reserved - to be defined in a future version of MATLAB
        % handles    structure with handles and user data (see GUIDATA)

    %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

    global R1;
    global R2;

```



```

        global R3;
        global R4;
        global R5;
        global V1;
        global I1;
        global I2;

        R1=str2double(get(handles.edit1,'String'));
        R2=str2double(get(handles.edit2,'String'));
        R3=str2double(get(handles.edit3,'String'));
        R4=str2double(get(handles.edit4,'String'));
        R5=str2double(get(handles.edit5,'String'));
        V1=str2double(get(handles.edit6,'String'));
        I1=str2double(get(handles.edit7,'String'));
        I2=str2double(get(handles.edit8,'String'));

        if (R1>10|R1<1)
h=warndlg('Βάλτε στην αντίσταση R1 τιμή μεταξύ 1 και 10');
            return
            end

        if (R2>10|R2<1)
h=warndlg('Βάλτε στην αντίσταση R2 τιμή μεταξύ 1 και 10');
            return
            end

        if (R3>10|R3<1)
h=warndlg('Βάλτε στην αντίσταση R3 τιμή μεταξύ 1 και 10');
            return
            end

        if (R4>10|R4<1)
h=warndlg('Βάλτε στην αντίσταση R4 τιμή μεταξύ 1 και 10');
            return
            end

        if (R5>10|R5<1)
h=warndlg('Βάλτε στην αντίσταση R5 τιμή μεταξύ 1 και 10');
            return
            end

        if (V1>15|V1<5)
h=warndlg('Βάλτε στην τάση V1 τιμή μεταξύ 5 και 15');
            return
            end

        if (I1>5|I1<1)
h=warndlg('Βάλτε στο ρεύμα I1 τιμή μεταξύ 1 και 5');
            return
            end

        if (I2>5|I2<1)
h=warndlg('Βάλτε στο ρεύμα I2 τιμή μεταξύ 1 και 5');
            return
            end

        axes(handles.axes1)
        axis off;
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
        global snmeio;
        snmeio=1;
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
        x_back=[-12,12,12,-12];
        y_back=[-12,-12,12,12];

        x_tableau=[-11,11,11,-11];
        y_tableau=[-11,-11,9,9];

        x01=-8;
        y01=5;
        th1=0;

        xres_11=x01+[0.40*sin(th1),0.40*sin(th1)+1.2*cos(th1),...
        -0.40*sin(th1)+1.2*cos(th1),-0.40*sin(th1)];
        yres_11=y01+[-0.40*cos(th1),-0.40*cos(th1)+1.2*sin(th1),...
        0.40*cos(th1)+1.2*sin(th1),0.40*cos(th1)];

        xres_12=x01+[-0.05*sin(th1),-0.05*sin(th1)+0.25*cos(th1),...
        -0.40*sin(th1)+0.3*cos(th1),...

```

```

0.25*sin(th1)+0.45*cos(th1),...
-0.40*sin(th1)+0.6*cos(th1),...
0.25*sin(th1)+0.75*cos(th1),...
-0.40*sin(th1)+0.9*cos(th1),...
-0.05*sin(th1)+0.95*cos(th1),...
-0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+0.95*cos(th1),...
-0.25*sin(th1)+0.9*cos(th1),...
0.40*sin(th1)+0.75*cos(th1),...
-0.25*sin(th1)+0.6*cos(th1),...
0.40*sin(th1)+0.45*cos(th1),...
-0.25*sin(th1)+0.3*cos(th1),...
0.05*sin(th1)+0.25*cos(th1),...
0.05*sin(th1)];
yres_12=y01+[0.05*cos(th1),0.05*cos(th1)+0.25*sin(th1),...
0.40*cos(th1)+0.3*sin(th1),...
-0.25*cos(th1)+0.45*sin(th1),...
0.40*cos(th1)+0.6*sin(th1),...
-0.250*cos(th1)+0.75*sin(th1),...
0.40*cos(th1)+0.9*sin(th1),...
0.05*cos(th1)+0.95*sin(th1),...
0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+0.95*sin(th1),...
0.25*cos(th1)+0.9*sin(th1),...
-0.40*cos(th1)+0.75*sin(th1),...
0.25*cos(th1)+0.6*sin(th1),...
-0.40*cos(th1)+0.45*sin(th1),...
0.25*cos(th1)+0.3*sin(th1),...
-0.05*cos(th1)+0.25*sin(th1),...
-0.05*cos(th1)];

x02=-4;
y02=0;
th2=pi/2;

xres_21=x02+[0.25*sin(th2),0.25*sin(th2)+1.6*cos(th2),...
-0.25*sin(th2)+1.6*cos(th2),-0.25*sin(th2)];
yres_21=y02+[-0.25*cos(th2),-0.25*cos(th2)+1.6*sin(th2),...
0.25*cos(th2)+1.6*sin(th2),0.25*cos(th2)];

xres_22=x02+[-0.03*sin(th2),-0.03*sin(th2)+0.33*cos(th2),...
-0.25*sin(th2)+0.4*cos(th2),...
0.10*sin(th2)+0.6*cos(th2),...
-0.25*sin(th2)+0.8*cos(th2),...
0.10*sin(th2)+1.0*cos(th2),...
-0.25*sin(th2)+1.2*cos(th2),...
-0.03*sin(th2)+1.27*cos(th2),...
-0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.27*cos(th2),...
-0.10*sin(th2)+1.2*cos(th2),...
0.25*sin(th2)+1.0*cos(th2),...
-0.10*sin(th2)+0.8*cos(th2),...
0.25*sin(th2)+0.6*cos(th2),...
-0.10*sin(th2)+0.4*cos(th2),...
0.03*sin(th2)+0.33*cos(th2),...
0.03*sin(th2)];
yres_22=y02+[0.03*cos(th2),0.03*cos(th2)+0.33*sin(th2),...
0.25*cos(th2)+0.4*sin(th2),...
-0.10*cos(th2)+0.6*sin(th2),...
0.25*cos(th2)+0.8*sin(th2),...
-0.10*cos(th2)+1.0*sin(th2),...
0.25*cos(th2)+1.2*sin(th2),...
0.03*cos(th2)+1.27*sin(th2),...
0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.27*sin(th2),...
0.10*cos(th2)+1.2*sin(th2),...
-0.25*cos(th2)+1.0*sin(th2),...
0.10*cos(th2)+0.8*sin(th2),...
-0.25*cos(th2)+0.6*sin(th2),...
0.10*cos(th2)+0.4*sin(th2),...
-0.03*cos(th2)+0.33*sin(th2),...
-0.03*cos(th2)];

x03=-1.5;
y03=5;

```

```

th3=0;

xres_31=x03+[0.40*sin(th3),0.40*sin(th3)+1.2*cos(th3),...
-0.40*sin(th3)+1.2*cos(th3),-0.40*sin(th3)];
yres_31=y03+[-0.40*cos(th3),-0.40*cos(th3)+1.2*sin(th3),...
0.40*cos(th3)+1.2*sin(th3),0.40*cos(th3)];

xres_32=x03+[-0.05*sin(th3),-0.05*sin(th3)+0.25*cos(th3),...
-0.40*sin(th3)+0.3*cos(th3),...
0.25*sin(th3)+0.45*cos(th3),...
-0.40*sin(th3)+0.6*cos(th3),...
0.25*sin(th3)+0.75*cos(th3),...
-0.40*sin(th3)+0.9*cos(th3),...
-0.05*sin(th3)+0.95*cos(th3),...
-0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+0.95*cos(th3),...
-0.25*sin(th3)+0.9*cos(th3),...
0.40*sin(th3)+0.75*cos(th3),...
-0.25*sin(th3)+0.6*cos(th3),...
0.40*sin(th3)+0.45*cos(th3),...
-0.25*sin(th3)+0.3*cos(th3),...
0.05*sin(th3)+0.25*cos(th3),...
0.05*sin(th3)];
yres_32=y03+[0.05*cos(th3),0.05*cos(th3)+0.25*sin(th3),...
0.40*cos(th3)+0.3*sin(th3),...
-0.25*cos(th3)+0.45*sin(th3),...
0.40*cos(th3)+0.6*sin(th3),...
-0.250*cos(th3)+0.75*sin(th3),...
0.40*cos(th3)+0.9*sin(th3),...
0.05*cos(th3)+0.95*sin(th3),...
0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+0.95*sin(th3),...
0.25*cos(th3)+0.9*sin(th3),...
-0.40*cos(th3)+0.75*sin(th3),...
0.25*cos(th3)+0.6*sin(th3),...
-0.40*cos(th3)+0.45*sin(th3),...
0.25*cos(th3)+0.3*sin(th3),...
-0.05*cos(th3)+0.25*sin(th3),...
-0.05*cos(th3)];

x04=3;
y04=5;
th4=0;

xres_41=x04+[0.40*sin(th4),0.40*sin(th4)+1.2*cos(th4),...
-0.40*sin(th4)+1.2*cos(th4),-0.40*sin(th4)];
yres_41=y04+[-0.40*cos(th4),-0.40*cos(th4)+1.2*sin(th4),...
0.40*cos(th4)+1.2*sin(th4),0.40*cos(th4)];

xres_42=x04+[-0.05*sin(th4),-0.05*sin(th4)+0.25*cos(th4),...
-0.40*sin(th4)+0.3*cos(th4),...
0.25*sin(th4)+0.45*cos(th4),...
-0.40*sin(th4)+0.6*cos(th4),...
0.25*sin(th4)+0.75*cos(th4),...
-0.40*sin(th4)+0.9*cos(th4),...
-0.05*sin(th4)+0.95*cos(th4),...
-0.05*sin(th4)+1.2*cos(th4),...
0.05*sin(th4)+1.2*cos(th4),...
0.05*sin(th4)+0.95*cos(th4),...
-0.25*sin(th4)+0.9*cos(th4),...
0.40*sin(th4)+0.75*cos(th4),...
-0.25*sin(th4)+0.6*cos(th4),...
0.40*sin(th4)+0.45*cos(th4),...
-0.25*sin(th4)+0.3*cos(th4),...
0.05*sin(th4)+0.25*cos(th4),...
0.05*sin(th4)];
yres_42=y04+[0.05*cos(th4),0.05*cos(th4)+0.25*sin(th4),...
0.40*cos(th4)+0.3*sin(th4),...
-0.25*cos(th4)+0.45*sin(th4),...
0.40*cos(th4)+0.6*sin(th4),...
-0.250*cos(th4)+0.75*sin(th4),...
0.40*cos(th4)+0.9*sin(th4),...
0.05*cos(th4)+0.95*sin(th4),...
0.05*cos(th4)+1.2*sin(th4),...
-0.05*cos(th4)+1.2*sin(th4),...
-0.05*cos(th4)+0.95*sin(th4),...
0.25*cos(th4)+0.9*sin(th4),...
-0.40*cos(th4)+0.75*sin(th4),...

```

```

0.25*cos(th4)+0.6*sin(th4),...
-0.40*cos(th4)+0.45*sin(th4),...
0.25*cos(th4)+0.3*sin(th4),...
-0.05*cos(th4)+0.25*sin(th4),...
-0.05*cos(th4)];

x05=9;
y05=0;
th5=pi/2;

xres_51=x05+[0.25*sin(th5),0.25*sin(th5)+1.6*cos(th5),...
-0.25*sin(th5)+1.6*cos(th5),-0.25*sin(th5)];
yres_51=y05+[-0.25*cos(th5),-0.25*cos(th5)+1.6*sin(th5),...
0.25*cos(th5)+1.6*sin(th5),0.25*cos(th5)];

xres_52=x05+[-0.03*sin(th5),-0.03*sin(th5)+0.33*cos(th5),...
-0.25*sin(th5)+0.4*cos(th5),...
0.10*sin(th5)+0.6*cos(th5),...
-0.25*sin(th5)+0.8*cos(th5),...
0.10*sin(th5)+1.0*cos(th5),...
-0.25*sin(th5)+1.2*cos(th5),...
-0.03*sin(th5)+1.27*cos(th5),...
-0.03*sin(th5)+1.6*cos(th5),...
0.03*sin(th5)+1.6*cos(th5),...
0.03*sin(th5)+1.27*cos(th5),...
-0.10*sin(th5)+1.2*cos(th5),...
0.25*sin(th5)+1.0*cos(th5),...
-0.10*sin(th5)+0.8*cos(th5),...
0.25*sin(th5)+0.6*cos(th5),...
-0.10*sin(th5)+0.4*cos(th5),...
0.03*sin(th5)+0.33*cos(th5),...
0.03*sin(th5)];
yres_52=y05+[0.03*cos(th5),0.03*cos(th5)+0.33*sin(th5),...
0.25*cos(th5)+0.4*sin(th5),...
-0.10*cos(th5)+0.6*sin(th5),...
0.25*cos(th5)+0.8*sin(th5),...
-0.10*cos(th5)+1.0*sin(th5),...
0.25*cos(th5)+1.2*sin(th5),...
0.03*cos(th5)+1.27*sin(th5),...
0.03*cos(th5)+1.6*sin(th5),...
-0.03*cos(th5)+1.6*sin(th5),...
-0.03*cos(th5)+1.27*sin(th5),...
0.10*cos(th5)+1.2*sin(th5),...
-0.25*cos(th5)+1.0*sin(th5),...
0.10*cos(th5)+0.8*sin(th5),...
-0.25*cos(th5)+0.6*sin(th5),...
0.10*cos(th5)+0.4*sin(th5),...
-0.03*cos(th5)+0.33*sin(th5),...
-0.03*cos(th5)];

x06=-9.5;
y06=0;

xv1_1=x06+[-1.0,1.0,1.0,-1.0];
yv1_1=y06+[-0.05,-0.05,0.05,0.05]+0.3;

xv1_2=x06+[-0.4,0.4,0.4,-0.4];
yv1_2=y06+[-0.1,-0.1,0.1,0.1]-0.1;

x07=1.5;
y07=0;
phi7=0:0.01:2*pi;

xi1_1=x07+0.6*cos(phi7);
yi1_1=y07+0.9*sin(phi7);

xi1_2=x07+0.55*cos(phi7);
yi1_2=y07+0.85*sin(phi7);

xi1_3=x07+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yi1_3=y07+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

x08=6.5;
y08=0;
phi8=0:0.01:2*pi;

xi2_1=x08+0.6*cos(phi8);
yi2_1=y08+0.9*sin(phi8);

```

```

xI2_2=x08+0.55*cos(phi8);
yI2_2=y08+0.85*sin(phi8);
xI2_3=x08+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI2_3=y08+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

xcable1=[-9.5,-9.5,-8,-8];
ycable1=y01+[0.1,-0.1,-0.1,0.1];

xcable2=[-9.55,-9.45,-9.45,-9.55];
ycable2=[y01+0.1,y01+0.1,y06+0.4,y06+0.4];

xcable3=[-9.55,-9.45,-9.45,-9.55];
ycable3=[y06-0.2,y06-0.2,-5.0,-5.0];

xcable4=[-9.5,-9.5,9,9];
ycable4=-5.0+[0.1,-0.1,-0.1,0.1];

xcable5=[8.95,9.05,9.05,8.95];
ycable5=[-4.9,-4.9,0.0,0.0];

xcable6=[8.95,9.05,9.05,8.95];
ycable6=[4.9,4.9,1.6,1.6];

xcable7=[x04+1.2,x04+1.2,9.05,9.05];
ycable7=y01+[0.1,-0.1,-0.1,0.1];

xcable8=[x04,x04,x03+1.2,x03+1.2];
ycable8=y01+[0.1,-0.1,-0.1,0.1];

xcable9=[x03,x03,x01+1.2,x01+1.2];
ycable9=y01+[0.1,-0.1,-0.1,0.1];

xcable10=[-3.95,-4.05,-4.05,-3.95];
ycable10=[y01+0.1,y01+0.1,y02+1.6,y02+1.6];

xcable11=[-3.95,-4.05,-4.05,-3.95];
ycable11=[-4.9,-4.9,y02,y02];

xcable12=[1.45,1.55,1.55,1.45];
ycable12=[y01+0.1,y01+0.1,y07+0.9,y07+0.9];

xcable13=[1.45,1.55,1.55,1.45];
ycable13=[-4.9,-4.9,y07-0.9,y07-0.9];

xcable14=[1.45,1.55,1.55,1.45]+5.0;
ycable14=[y01+0.1,y01+0.1,y07+0.9,y07+0.9];

xcable15=[1.45,1.55,1.55,1.45]+5.0;
ycable15=[-4.9,-4.9,y07-0.9,y07-0.9];

xcurr=1.0+[-3.95,-3.45,-3.45,-3.25,-3.45,-3.45,-3.95];
ycurr=y01+[0.1,0.1,0.3,0.0,-0.3,-0.1,-0.1];

```

```

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_11,yres_11,[1.0,1.0,1.0],...
xres_12,yres_12,[0.0,0.0,0.0],...
xres_21,yres_21,[1.0,1.0,1.0],...
xres_22,yres_22,[0.0,0.0,0.0],...
xres_31,yres_31,[1.0,1.0,1.0],...
xres_32,yres_32,[0.0,0.0,0.0],...
xres_41,yres_41,[1.0,1.0,1.0],...
xres_42,yres_42,[0.0,0.0,0.0],...
xres_51,yres_51,[1.0,1.0,1.0],...
xres_52,yres_52,[0.0,0.0,0.0],...
xv1_1,yv1_1,[0.0,0.0,0.0],...
xv1_2,yv1_2,[0.0,0.0,0.0],...
xi1_1,yi1_1,[0.0,0.0,0.0],...
xi1_2,yi1_2,[1.0,1.0,1.0],...
xi1_3,yi1_3,[0.0,0.0,0.0],...
xi2_1,yi2_1,[0.0,0.0,0.0],...
xi2_2,yi2_2,[1.0,1.0,1.0],...
xi2_3,yi2_3,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...

```

```

        xcable7,ycable7,[0.8,0.6,0.2],...
        xcable8,ycable8,[0.8,0.6,0.2],...
        xcable9,ycable9,[0.8,0.6,0.2],...
        xcable10,ycable10,[0.8,0.6,0.2],...
        xcable11,ycable11,[0.8,0.6,0.2],...
        xcable12,ycable12,[0.8,0.6,0.2],...
        xcable13,ycable13,[0.8,0.6,0.2],...
        xcable14,ycable14,[0.8,0.6,0.2],...
        xcable15,ycable15,[0.8,0.6,0.2],...
        xcurr,ycurr,[0.0,0.0,0.0],...
        'LineStyle','None')

text(-11,11,'Υπολογίζουμε αρχικά τα ισοδύναμα κατά Thevenin κυκλώματα από τα άκρα (a,c) και (b,d)')
text(-7.5,6.5,'R_1','Color',[0.9,0.2,0.0])
text(-5.0,0.7,'R_2','Color',[0.9,0.2,0.0])
text(-1.0,6.5,'R_3','Color',[0.9,0.2,0.0])
text(3.5,6.5,'R_4','Color',[0.9,0.2,0.0])
text(9.5,0.7,'R_5','Color',[0.9,0.2,0.0])
text(-10.5,1.0,'V_1','Color',[0.0,0.2,0.9])
text(0.5,0.0,'I_1','Color',[0.0,0.4,0.4])
text(5.5,0.0,'I_2','Color',[0.0,0.4,0.4])
text(-4.25,5.5,'a','Color',[0.1,0.1,0.1])
text(-4.25,-5.5,'c','Color',[0.1,0.1,0.1])
text(1.25,5.5,'b','Color',[0.1,0.1,0.1])
text(1.25,-5.5,'d','Color',[0.1,0.1,0.1])
text(6.25,5.5,'e','Color',[0.1,0.1,0.1])
text(-2.8,6.0,'I','Color',[0.1,0.1,0.1])

        axis([-12,12,-12,12])
        axis off;
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
% --- Executes on button press in pushbutton2.
function pushbutton2_Callback(hObject, eventdata, handles)
% hObject handle to pushbutton2 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
        global R1;
        global R2;
        global R3;
        global R4;
        global R5;
        global V1;
        global I1;
        global I2;

        global snmeio;

        snmeio=snmeio+1;

        if (snmeio==6)
            snmeio=1;
            end

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
        RT1=R1*R2/(R1+R2);
        VT1=V1*R2/(R1+R2);
        nRT1=num2str(0.01*round(100*RT1));
        nVT1=num2str(0.01*round(100*VT1));
        RT2=R4+R5;
        nRT2=num2str(0.01*round(100*RT2));
        Ve=I2*R4*R5/(R4+R5);
        nVe=num2str(0.01*round(100*Ve));
        IN2=I1+(Ve/R4);
        nIN2=num2str(0.01*round(100*IN2));
        VT2=IN2*RT2;
        nVT2=num2str(0.01*round(100*VT2));
        I=(VT1-VT2)/(RT1+RT2+R3);
        nI=num2str(0.01*round(100*I));
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
        if (snmeio==1)
            axes(handles.axes1);
            cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
            x_back=[-12,12,12,-12];
            y_back=[-12,-12,12,12];

```

```

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,9,9];

x01=-8;
y01=5;
th1=0;

xres_11=x01+[0.40*sin(th1),0.40*sin(th1)+1.2*cos(th1),...
-0.40*sin(th1)+1.2*cos(th1),-0.40*sin(th1)];
yres_11=y01+[-0.40*cos(th1),-0.40*cos(th1)+1.2*sin(th1),...
0.40*cos(th1)+1.2*sin(th1),0.40*cos(th1)];

xres_12=x01+[-0.05*sin(th1),-0.05*sin(th1)+0.25*cos(th1),...
-0.40*sin(th1)+0.3*cos(th1),...
0.25*sin(th1)+0.45*cos(th1),...
-0.40*sin(th1)+0.6*cos(th1),...
0.25*sin(th1)+0.75*cos(th1),...
-0.40*sin(th1)+0.9*cos(th1),...
-0.05*sin(th1)+0.95*cos(th1),...
-0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+0.95*cos(th1),...
-0.25*sin(th1)+0.9*cos(th1),...
0.40*sin(th1)+0.75*cos(th1),...
-0.25*sin(th1)+0.6*cos(th1),...
0.40*sin(th1)+0.45*cos(th1),...
-0.25*sin(th1)+0.3*cos(th1),...
0.05*sin(th1)+0.25*cos(th1),...
0.05*sin(th1)];
yres_12=y01+[0.05*cos(th1),0.05*cos(th1)+0.25*sin(th1),...
0.40*cos(th1)+0.3*sin(th1),...
-0.25*cos(th1)+0.45*sin(th1),...
0.40*cos(th1)+0.6*sin(th1),...
-0.25*cos(th1)+0.75*sin(th1),...
0.40*cos(th1)+0.9*sin(th1),...
0.05*cos(th1)+0.95*sin(th1),...
0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+0.95*sin(th1),...
0.25*cos(th1)+0.9*sin(th1),...
-0.40*cos(th1)+0.75*sin(th1),...
0.25*cos(th1)+0.6*sin(th1),...
-0.40*cos(th1)+0.45*sin(th1),...
0.25*cos(th1)+0.3*sin(th1),...
-0.05*cos(th1)+0.25*sin(th1),...
-0.05*cos(th1)];

x02=-4;
y02=0;
th2=pi/2;

xres_21=x02+[0.25*sin(th2),0.25*sin(th2)+1.6*cos(th2),...
-0.25*sin(th2)+1.6*cos(th2),-0.25*sin(th2)];
yres_21=y02+[-0.25*cos(th2),-0.25*cos(th2)+1.6*sin(th2),...
0.25*cos(th2)+1.6*sin(th2),0.25*cos(th2)];

xres_22=x02+[-0.03*sin(th2),-0.03*sin(th2)+0.33*cos(th2),...
-0.25*sin(th2)+0.4*cos(th2),...
0.10*sin(th2)+0.6*cos(th2),...
-0.25*sin(th2)+0.8*cos(th2),...
0.10*sin(th2)+1.0*cos(th2),...
-0.25*sin(th2)+1.2*cos(th2),...
-0.03*sin(th2)+1.27*cos(th2),...
-0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.27*cos(th2),...
-0.10*sin(th2)+1.2*cos(th2),...
0.25*sin(th2)+1.0*cos(th2),...
-0.10*sin(th2)+0.8*cos(th2),...
0.25*sin(th2)+0.6*cos(th2),...
-0.10*sin(th2)+0.4*cos(th2),...
0.03*sin(th2)+0.33*cos(th2),...
0.03*sin(th2)];
yres_22=y02+[0.03*cos(th2),0.03*cos(th2)+0.33*sin(th2),...
0.25*cos(th2)+0.4*sin(th2),...
-0.10*cos(th2)+0.6*sin(th2),...
0.25*cos(th2)+0.8*sin(th2),...
-0.10*cos(th2)+1.0*sin(th2),...
0.25*cos(th2)+1.2*sin(th2),...
0.03*cos(th2)+1.27*sin(th2),...

```

```

0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.27*sin(th2),...
0.10*cos(th2)+1.2*sin(th2),...
-0.25*cos(th2)+1.0*sin(th2),...
0.10*cos(th2)+0.8*sin(th2),...
-0.25*cos(th2)+0.6*sin(th2),...
0.10*cos(th2)+0.4*sin(th2),...
-0.03*cos(th2)+0.33*sin(th2),...
-0.03*cos(th2)];

x03=-1.5;
y03=5;
th3=0;

xres_31=x03+[0.40*sin(th3),0.40*sin(th3)+1.2*cos(th3),...
-0.40*sin(th3)+1.2*cos(th3),-0.40*sin(th3)];
yres_31=y03+[-0.40*cos(th3),-0.40*cos(th3)+1.2*sin(th3),...
0.40*cos(th3)+1.2*sin(th3),0.40*cos(th3)];

xres_32=x03+[-0.05*sin(th3),-0.05*sin(th3)+0.25*cos(th3),...
-0.40*sin(th3)+0.3*cos(th3),...
0.25*sin(th3)+0.45*cos(th3),...
-0.40*sin(th3)+0.6*cos(th3),...
0.25*sin(th3)+0.75*cos(th3),...
-0.40*sin(th3)+0.9*cos(th3),...
-0.05*sin(th3)+0.95*cos(th3),...
-0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+0.95*cos(th3),...
-0.25*sin(th3)+0.9*cos(th3),...
0.40*sin(th3)+0.75*cos(th3),...
-0.25*sin(th3)+0.6*cos(th3),...
0.40*sin(th3)+0.45*cos(th3),...
-0.25*sin(th3)+0.3*cos(th3),...
0.05*sin(th3)+0.25*cos(th3),...
0.05*sin(th3)];
yres_32=y03+[0.05*cos(th3),0.05*cos(th3)+0.25*sin(th3),...
0.40*cos(th3)+0.3*sin(th3),...
-0.25*cos(th3)+0.45*sin(th3),...
0.40*cos(th3)+0.6*sin(th3),...
-0.25*cos(th3)+0.75*sin(th3),...
0.40*cos(th3)+0.9*sin(th3),...
0.05*cos(th3)+0.95*sin(th3),...
0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+0.95*sin(th3),...
0.25*cos(th3)+0.9*sin(th3),...
-0.40*cos(th3)+0.75*sin(th3),...
0.25*cos(th3)+0.6*sin(th3),...
-0.40*cos(th3)+0.45*sin(th3),...
0.25*cos(th3)+0.3*sin(th3),...
-0.05*cos(th3)+0.25*sin(th3),...
-0.05*cos(th3)];

x04=3;
y04=5;
th4=0;

xres_41=x04+[0.40*sin(th4),0.40*sin(th4)+1.2*cos(th4),...
-0.40*sin(th4)+1.2*cos(th4),-0.40*sin(th4)];
yres_41=y04+[-0.40*cos(th4),-0.40*cos(th4)+1.2*sin(th4),...
0.40*cos(th4)+1.2*sin(th4),0.40*cos(th4)];

xres_42=x04+[-0.05*sin(th4),-0.05*sin(th4)+0.25*cos(th4),...
-0.40*sin(th4)+0.3*cos(th4),...
0.25*sin(th4)+0.45*cos(th4),...
-0.40*sin(th4)+0.6*cos(th4),...
0.25*sin(th4)+0.75*cos(th4),...
-0.40*sin(th4)+0.9*cos(th4),...
-0.05*sin(th4)+0.95*cos(th4),...
-0.05*sin(th4)+1.2*cos(th4),...
0.05*sin(th4)+1.2*cos(th4),...
0.05*sin(th4)+0.95*cos(th4),...
-0.25*sin(th4)+0.9*cos(th4),...
0.40*sin(th4)+0.75*cos(th4),...
-0.25*sin(th4)+0.6*cos(th4),...
0.40*sin(th4)+0.45*cos(th4),...
-0.25*sin(th4)+0.3*cos(th4),...
-0.25*sin(th4)+0.3*cos(th4),...

```



```

0.05*sin(th4)+0.25*cos(th4),...
0.05*sin(th4)];
yres_42=y04+[0.05*cos(th4),0.05*cos(th4)+0.25*sin(th4),...
0.40*cos(th4)+0.3*sin(th4),...
-0.25*cos(th4)+0.45*sin(th4),...
0.40*cos(th4)+0.6*sin(th4),...
-0.250*cos(th4)+0.75*sin(th4),...
0.40*cos(th4)+0.9*sin(th4),...
0.05*cos(th4)+0.95*sin(th4),...
0.05*cos(th4)+1.2*sin(th4),...
-0.05*cos(th4)+1.2*sin(th4),...
-0.05*cos(th4)+0.95*sin(th4),...
0.25*cos(th4)+0.9*sin(th4),...
-0.40*cos(th4)+0.75*sin(th4),...
0.25*cos(th4)+0.6*sin(th4),...
-0.40*cos(th4)+0.45*sin(th4),...
0.25*cos(th4)+0.3*sin(th4),...
-0.05*cos(th4)+0.25*sin(th4),...
-0.05*cos(th4)];

x05=9;
y05=0;
th5=pi/2;

xres_51=x05+[0.25*sin(th5),0.25*sin(th5)+1.6*cos(th5),...
-0.25*sin(th5)+1.6*cos(th5),-0.25*sin(th5)];
yres_51=y05+[-0.25*cos(th5),-0.25*cos(th5)+1.6*sin(th5),...
0.25*cos(th5)+1.6*sin(th5),0.25*cos(th5)];

xres_52=x05+[-0.03*sin(th5),-0.03*sin(th5)+0.33*cos(th5),...
-0.25*sin(th5)+0.4*cos(th5),...
0.10*sin(th5)+0.6*cos(th5),...
-0.25*sin(th5)+0.8*cos(th5),...
0.10*sin(th5)+1.0*cos(th5),...
-0.25*sin(th5)+1.2*cos(th5),...
-0.03*sin(th5)+1.27*cos(th5),...
-0.03*sin(th5)+1.6*cos(th5),...
0.03*sin(th5)+1.6*cos(th5),...
0.03*sin(th5)+1.27*cos(th5),...
-0.10*sin(th5)+1.2*cos(th5),...
0.25*sin(th5)+1.0*cos(th5),...
-0.10*sin(th5)+0.8*cos(th5),...
0.25*sin(th5)+0.6*cos(th5),...
-0.10*sin(th5)+0.4*cos(th5),...
0.03*sin(th5)+0.33*cos(th5),...
0.03*sin(th5)];
yres_52=y05+[0.03*cos(th5),0.03*cos(th5)+0.33*sin(th5),...
0.25*cos(th5)+0.4*sin(th5),...
-0.10*cos(th5)+0.6*sin(th5),...
0.25*cos(th5)+0.8*sin(th5),...
-0.10*cos(th5)+1.0*sin(th5),...
0.25*cos(th5)+1.2*sin(th5),...
0.03*cos(th5)+1.27*sin(th5),...
0.03*cos(th5)+1.6*sin(th5),...
-0.03*cos(th5)+1.6*sin(th5),...
-0.03*cos(th5)+1.27*sin(th5),...
0.10*cos(th5)+1.2*sin(th5),...
-0.25*cos(th5)+1.0*sin(th5),...
0.10*cos(th5)+0.8*sin(th5),...
-0.25*cos(th5)+0.6*sin(th5),...
0.10*cos(th5)+0.4*sin(th5),...
-0.03*cos(th5)+0.33*sin(th5),...
-0.03*cos(th5)];

x06=-9.5;
y06=0;

xV1_1=x06+[-1.0,1.0,1.0,-1.0];
yV1_1=y06+[-0.05,-0.05,0.05,0.05]+0.3;

xV1_2=x06+[-0.4,0.4,0.4,-0.4];
yV1_2=y06+[-0.1,-0.1,0.1,0.1]-0.1;

x07=1.5;
y07=0;
phi7=0:0.01:2*pi;

xI1_1=x07+0.6*cos(phi7);
yI1_1=y07+0.9*sin(phi7);

```

```

        xI1_2=x07+0.55*cos(phi7);
        yI1_2=y07+0.85*sin(phi7);

xI1_3=x07+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI1_3=y07+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

        x08=6.5;
        y08=0;
        phi8=0:0.01:2*pi;

        xI2_1=x08+0.6*cos(phi8);
        yI2_1=y08+0.9*sin(phi8);

        xI2_2=x08+0.55*cos(phi8);
        yI2_2=y08+0.85*sin(phi8);

xI2_3=x08+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI2_3=y08+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

        xcable1=[-9.5,-9.5,-8,-8];
        ycable1=y01+[0.1,-0.1,-0.1,0.1];

        xcable2=[-9.55,-9.45,-9.45,-9.55];
        ycable2=[y01+0.1,y01+0.1,y06+0.4,y06+0.4];

        xcable3=[-9.55,-9.45,-9.45,-9.55];
        ycable3=[y06-0.2,y06-0.2,-5.0,-5.0];

        xcable4=[-9.5,-9.5,9,9];
        ycable4=-5.0+[0.1,-0.1,-0.1,0.1];

        xcable5=[8.95,9.05,9.05,8.95];
        ycable5=[-4.9,-4.9,0.0,0.0];

        xcable6=[8.95,9.05,9.05,8.95];
        ycable6=[4.9,4.9,1.6,1.6];

        xcable7=[x04+1.2,x04+1.2,9.05,9.05];
        ycable7=y01+[0.1,-0.1,-0.1,0.1];

        xcable8=[x04,x04,x03+1.2,x03+1.2];
        ycable8=y01+[0.1,-0.1,-0.1,0.1];

        xcable9=[x03,x03,x01+1.2,x01+1.2];
        ycable9=y01+[0.1,-0.1,-0.1,0.1];

        xcable10=[-3.95,-4.05,-4.05,-3.95];
        ycable10=[y01+0.1,y01+0.1,y02+1.6,y02+1.6];

        xcable11=[-3.95,-4.05,-4.05,-3.95];
        ycable11=[-4.9,-4.9,y02,y02];

        xcable12=[1.45,1.55,1.55,1.45];
        ycable12=[y01+0.1,y01+0.1,y07+0.9,y07+0.9];

        xcable13=[1.45,1.55,1.55,1.45];
        ycable13=[-4.9,-4.9,y07-0.9,y07-0.9];

        xcable14=[1.45,1.55,1.55,1.45]+5.0;
        ycable14=[y01+0.1,y01+0.1,y07+0.9,y07+0.9];

        xcable15=[1.45,1.55,1.55,1.45]+5.0;
        ycable15=[-4.9,-4.9,y07-0.9,y07-0.9];

xcurr=1.0+[-3.95,-3.45,-3.45,-3.25,-3.45,-3.45,-3.95];
ycurr=y01+[0.1,0.1,0.3,0.0,-0.3,-0.1,-0.1];

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_11,yres_11,[1.0,1.0,1.0],...
xres_12,yres_12,[0.0,0.0,0.0],...
xres_21,yres_21,[1.0,1.0,1.0],...
xres_22,yres_22,[0.0,0.0,0.0],...
xres_31,yres_31,[1.0,1.0,1.0],...
xres_32,yres_32,[0.0,0.0,0.0],...
xres_41,yres_41,[1.0,1.0,1.0],...
xres_42,yres_42,[0.0,0.0,0.0],...
xres_51,yres_51,[1.0,1.0,1.0],...
xres_52,yres_52,[0.0,0.0,0.0],...

```

```

xV1_1,yV1_1,[0.0,0.0,0.0],...
xV1_2,yV1_2,[0.0,0.0,0.0],...
xI1_1,yI1_1,[0.0,0.0,0.0],...
xI1_2,yI1_2,[1.0,1.0,1.0],...
xI1_3,yI1_3,[0.0,0.0,0.0],...
xI2_1,yI2_1,[0.0,0.0,0.0],...
xI2_2,yI2_2,[1.0,1.0,1.0],...
xI2_3,yI2_3,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
xcable10,ycable10,[0.8,0.6,0.2],...
xcable11,ycable11,[0.8,0.6,0.2],...
xcable12,ycable12,[0.8,0.6,0.2],...
xcable13,ycable13,[0.8,0.6,0.2],...
xcable14,ycable14,[0.8,0.6,0.2],...
xcable15,ycable15,[0.8,0.6,0.2],...
xcurr,ycurr,[0.0,0.0,0.0],...
'LineStyle','None')

text(-11,11,'Υπολογίζουμε αρχικά τα ισοδύναμα κατά Thevenin κυκλώματα από τα άκρα (a,c) και (b,d)')
text(-7.5,6.5,'R_1','Color',[0.9,0.2,0.0])
text(-5.0,0.7,'R_2','Color',[0.9,0.2,0.0])
text(-1.0,6.5,'R_3','Color',[0.9,0.2,0.0])
text(3.5,6.5,'R_4','Color',[0.9,0.2,0.0])
text(9.5,0.7,'R_5','Color',[0.9,0.2,0.0])
text(-10.5,1.0,'V_1','Color',[0.0,0.2,0.9])
text(0.5,0.0,'I_1','Color',[0.0,0.4,0.4])
text(5.5,0.0,'I_2','Color',[0.0,0.4,0.4])
text(-4.25,5.5,'a','Color',[0.1,0.1,0.1])
text(-4.25,-5.5,'c','Color',[0.1,0.1,0.1])
text(1.25,5.5,'b','Color',[0.1,0.1,0.1])
text(1.25,-5.5,'d','Color',[0.1,0.1,0.1])
text(6.25,5.5,'e','Color',[0.1,0.1,0.1])
text(-2.8,6.0,'I','Color',[0.1,0.1,0.1])

axis([-12,12,-12,12])
axis off;
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
elseif (snmeio==2)
axes(handles.axes1);
cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,9,9];

x01=-8;
y01=5;
th1=0;

xres_11=x01+[0.40*sin(th1),0.40*sin(th1)+1.2*cos(th1),...
-0.40*sin(th1)+1.2*cos(th1),-0.40*sin(th1)];
yres_11=y01+[-0.40*cos(th1),-0.40*cos(th1)+1.2*sin(th1),...
0.40*cos(th1)+1.2*sin(th1),0.40*cos(th1)];

xres_12=x01+[-0.05*sin(th1),-0.05*sin(th1)+0.25*cos(th1),...
-0.40*sin(th1)+0.3*cos(th1),...
0.25*sin(th1)+0.45*cos(th1),...
-0.40*sin(th1)+0.6*cos(th1),...
0.25*sin(th1)+0.75*cos(th1),...
-0.40*sin(th1)+0.9*cos(th1),...
-0.05*sin(th1)+0.95*cos(th1),...
-0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+0.95*cos(th1),...
-0.25*sin(th1)+0.9*cos(th1),...
0.40*sin(th1)+0.75*cos(th1),...
-0.25*sin(th1)+0.6*cos(th1),...
0.40*sin(th1)+0.45*cos(th1),...
-0.25*sin(th1)+0.3*cos(th1),...

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```

0.05*sin(th1)+0.25*cos(th1),...
0.05*sin(th1)];
yres_12=y01+[0.05*cos(th1),0.05*cos(th1)+0.25*sin(th1),...
0.40*cos(th1)+0.3*sin(th1),...
-0.25*cos(th1)+0.45*sin(th1),...
0.40*cos(th1)+0.6*sin(th1),...
-0.250*cos(th1)+0.75*sin(th1),...
0.40*cos(th1)+0.9*sin(th1),...
0.05*cos(th1)+0.95*sin(th1),...
0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+0.95*sin(th1),...
0.25*cos(th1)+0.9*sin(th1),...
-0.40*cos(th1)+0.75*sin(th1),...
0.25*cos(th1)+0.6*sin(th1),...
-0.40*cos(th1)+0.45*sin(th1),...
0.25*cos(th1)+0.3*sin(th1),...
-0.05*cos(th1)+0.25*sin(th1),...
-0.05*cos(th1)];

x02=-4;
y02=0;
th2=pi/2;

xres_21=x02+[0.25*sin(th2),0.25*sin(th2)+1.6*cos(th2),...
-0.25*sin(th2)+1.6*cos(th2),-0.25*sin(th2)];
yres_21=y02+[-0.25*cos(th2),-0.25*cos(th2)+1.6*sin(th2),...
0.25*cos(th2)+1.6*sin(th2),0.25*cos(th2)];

xres_22=x02+[-0.03*sin(th2),-0.03*sin(th2)+0.33*cos(th2),...
-0.25*sin(th2)+0.4*cos(th2),...
0.10*sin(th2)+0.6*cos(th2),...
-0.25*sin(th2)+0.8*cos(th2),...
0.10*sin(th2)+1.0*cos(th2),...
-0.25*sin(th2)+1.2*cos(th2),...
-0.03*sin(th2)+1.27*cos(th2),...
-0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.27*cos(th2),...
-0.10*sin(th2)+1.2*cos(th2),...
0.25*sin(th2)+1.0*cos(th2),...
-0.10*sin(th2)+0.8*cos(th2),...
0.25*sin(th2)+0.6*cos(th2),...
-0.10*sin(th2)+0.4*cos(th2),...
0.03*sin(th2)+0.33*cos(th2),...
0.03*sin(th2)];
yres_22=y02+[0.03*cos(th2),0.03*cos(th2)+0.33*sin(th2),...
0.25*cos(th2)+0.4*sin(th2),...
-0.10*cos(th2)+0.6*sin(th2),...
0.25*cos(th2)+0.8*sin(th2),...
-0.10*cos(th2)+1.0*sin(th2),...
0.25*cos(th2)+1.2*sin(th2),...
0.03*cos(th2)+1.27*sin(th2),...
0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.27*sin(th2),...
0.10*cos(th2)+1.2*sin(th2),...
-0.25*cos(th2)+1.0*sin(th2),...
0.10*cos(th2)+0.8*sin(th2),...
-0.25*cos(th2)+0.6*sin(th2),...
0.10*cos(th2)+0.4*sin(th2),...
-0.03*cos(th2)+0.33*sin(th2),...
-0.03*cos(th2)];

x06=-9.5;
y06=0;

xv1_1=x06+[-1.0,1.0,1.0,-1.0];
yv1_1=y06+[-0.05,-0.05,0.05,0.05]+0.3;

xv1_2=x06+[-0.4,0.4,0.4,-0.4];
yv1_2=y06+[-0.1,-0.1,0.1,0.1]-0.1;

xcable1=[-9.5,-9.5,-8,-8];
ycable1=y01+[0.1,-0.1,-0.1,0.1];

xcable2=[-9.55,-9.45,-9.45,-9.55];
ycable2=[y01+0.1,y01+0.1,y06+0.4,y06+0.4];

```

```

xcable3=[-9.55,-9.45,-9.45,-9.55];
ycable3=[y06-0.2,y06-0.2,-5.0,-5.0];

x03=-1.5;

xcable4=[-9.5,-9.5,x03,x03];
ycable4=-5.0+[0.1,-0.1,-0.1,0.1];

xcable9=[x03,x03,x01+1.2,x01+1.2];
ycable9=y01+[0.1,-0.1,-0.1,0.1];

xcable10=[-3.95,-4.05,-4.05,-3.95];
ycable10=[y01+0.1,y01+0.1,y02+1.6,y02+1.6];

xcable11=[-3.95,-4.05,-4.05,-3.95];
ycable11=[-4.9,-4.9,y02,y02];

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_11,yres_11,[1.0,1.0,1.0],...
xres_12,yres_12,[0.0,0.0,0.0],...
xres_21,yres_21,[1.0,1.0,1.0],...
xres_22,yres_22,[0.0,0.0,0.0],...
xV1_1,yV1_1,[0.0,0.0,0.0],...
xV1_2,yV1_2,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
xcable10,ycable10,[0.8,0.6,0.2],...
xcable11,ycable11,[0.8,0.6,0.2],...
'Linestyle','None')

text(-11,11,'Υπολογίζουμε αρχικά το ισοδύναμο Thevenin από τα άκρα (a,c). Θα είναι
R_{T1}=R_{1}R_{2}/(R_{1}+R_{2})=')
text(6.2,11.1,nRT1)
text(7.1,11.1,'Ohm')
text(-11,10.0,'και V_{T1}=V_{1}R_{2}/(R_{1}+R_{2})=')
text(-6.2,10.1,nVT1)
text(-5.1,10.1,'Volt')

text(-7.5,6.5,'R_1','Color',[0.9,0.2,0.0])
text(-5.0,0.7,'R_2','Color',[0.9,0.2,0.0])
text(-10.5,1.0,'V_1','Color',[0.0,0.2,0.9])
text(x03,5.5,'a','Color',[0.1,0.1,0.1])
text(x03,-5.5,'c','Color',[0.1,0.1,0.1])

axis([-12,12,-12,12])
axis off;
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

elseif (snmeio==3)
axes(handles.axes1);
cla

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,9,9];

x01=-8;
y01=5;
th1=0;

x02=-4;
y02=0;
th2=pi/2;

x03=-1.5;
y03=5;
th3=0;

x04=3;
y04=5;

```

```

th4=0;

xres_41=x04+[0.40*sin(th4),0.40*sin(th4)+1.2*cos(th4),...
-0.40*sin(th4)+1.2*cos(th4),-0.40*sin(th4)];
yres_41=y04+[-0.40*cos(th4),-0.40*cos(th4)+1.2*sin(th4),...
0.40*cos(th4)+1.2*sin(th4),0.40*cos(th4)];

xres_42=x04+[-0.05*sin(th4),-0.05*sin(th4)+0.25*cos(th4),...
-0.40*sin(th4)+0.3*cos(th4),...
0.25*sin(th4)+0.45*cos(th4),...
-0.40*sin(th4)+0.6*cos(th4),...
0.25*sin(th4)+0.75*cos(th4),...
-0.40*sin(th4)+0.9*cos(th4),...
-0.05*sin(th4)+0.95*cos(th4),...
-0.05*sin(th4)+1.2*cos(th4),...
0.05*sin(th4)+1.2*cos(th4),...
0.05*sin(th4)+0.95*cos(th4),...
-0.25*sin(th4)+0.9*cos(th4),...
0.40*sin(th4)+0.75*cos(th4),...
-0.25*sin(th4)+0.6*cos(th4),...
0.40*sin(th4)+0.45*cos(th4),...
-0.25*sin(th4)+0.3*cos(th4),...
0.05*sin(th4)+0.25*cos(th4),...
0.05*sin(th4)];
yres_42=y04+[0.05*cos(th4),0.05*cos(th4)+0.25*sin(th4),...
0.40*cos(th4)+0.3*sin(th4),...
-0.25*cos(th4)+0.45*sin(th4),...
0.40*cos(th4)+0.6*sin(th4),...
-0.250*cos(th4)+0.75*sin(th4),...
0.40*cos(th4)+0.9*sin(th4),...
0.05*cos(th4)+0.95*sin(th4),...
0.05*cos(th4)+1.2*sin(th4),...
-0.05*cos(th4)+1.2*sin(th4),...
-0.05*cos(th4)+0.95*sin(th4),...
0.25*cos(th4)+0.9*sin(th4),...
-0.40*cos(th4)+0.75*sin(th4),...
0.25*cos(th4)+0.6*sin(th4),...
-0.40*cos(th4)+0.45*sin(th4),...
0.25*cos(th4)+0.3*sin(th4),...
-0.05*cos(th4)+0.25*sin(th4),...
-0.05*cos(th4)];

x05=9;
y05=0;
th5=pi/2;

xres_51=x05+[0.25*sin(th5),0.25*sin(th5)+1.6*cos(th5),...
-0.25*sin(th5)+1.6*cos(th5),-0.25*sin(th5)];
yres_51=y05+[-0.25*cos(th5),-0.25*cos(th5)+1.6*sin(th5),...
0.25*cos(th5)+1.6*sin(th5),0.25*cos(th5)];

xres_52=x05+[-0.03*sin(th5),-0.03*sin(th5)+0.33*cos(th5),...
-0.25*sin(th5)+0.4*cos(th5),...
0.10*sin(th5)+0.6*cos(th5),...
-0.25*sin(th5)+0.8*cos(th5),...
0.10*sin(th5)+1.0*cos(th5),...
-0.25*sin(th5)+1.2*cos(th5),...
-0.03*sin(th5)+1.27*cos(th5),...
-0.03*sin(th5)+1.6*cos(th5),...
0.03*sin(th5)+1.6*cos(th5),...
0.03*sin(th5)+1.27*cos(th5),...
-0.10*sin(th5)+1.2*cos(th5),...
0.25*sin(th5)+1.0*cos(th5),...
-0.10*sin(th5)+0.8*cos(th5),...
0.25*sin(th5)+0.6*cos(th5),...
-0.10*sin(th5)+0.4*cos(th5),...
0.03*sin(th5)+0.33*cos(th5),...
0.03*sin(th5)];
yres_52=y05+[0.03*cos(th5),0.03*cos(th5)+0.33*sin(th5),...
0.25*cos(th5)+0.4*sin(th5),...
-0.10*cos(th5)+0.6*sin(th5),...
0.25*cos(th5)+0.8*sin(th5),...
-0.10*cos(th5)+1.0*sin(th5),...
0.25*cos(th5)+1.2*sin(th5),...
0.03*cos(th5)+1.27*sin(th5),...
0.03*cos(th5)+1.6*sin(th5),...
-0.03*cos(th5)+1.6*sin(th5),...
-0.03*cos(th5)+1.27*sin(th5),...
0.10*cos(th5)+1.2*sin(th5),...

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-0.25*cos(th5)+1.0*sin(th5),...
0.10*cos(th5)+0.8*sin(th5),...
-0.25*cos(th5)+0.6*sin(th5),...
0.10*cos(th5)+0.4*sin(th5),...
-0.03*cos(th5)+0.33*sin(th5),...
-0.03*cos(th5)];
x06=-9.5;
y06=0;

x07=1.5;
y07=0;
phi7=0:0.01:2*pi;

xI1_1=x07+0.6*cos(phi7);
yI1_1=y07+0.9*sin(phi7);

xI1_2=x07+0.55*cos(phi7);
yI1_2=y07+0.85*sin(phi7);

xI1_3=x07+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI1_3=y07+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

x08=6.5;
y08=0;
phi8=0:0.01:2*pi;

xI2_1=x08+0.6*cos(phi8);
yI2_1=y08+0.9*sin(phi8);

xI2_2=x08+0.55*cos(phi8);
yI2_2=y08+0.85*sin(phi8);

xI2_3=x08+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI2_3=y08+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

xcable4=[x03+1.2,x03+1.2,9,9];
ycable4=-5.0+[0.1,-0.1,-0.1,0.1];

xcable5=[8.95,9.05,9.05,8.95];
ycable5=[-4.9,-4.9,0.0,0.0];

xcable6=[8.95,9.05,9.05,8.95];
ycable6=[4.9,4.9,1.6,1.6];

xcable7=[x04+1.2,x04+1.2,9.05,9.05];
ycable7=y01+[0.1,-0.1,-0.1,0.1];

xcable8=[x04,x04,x03+1.2,x03+1.2];
ycable8=y01+[0.1,-0.1,-0.1,0.1];

xcable12=[1.45,1.55,1.55,1.45];
ycable12=[y01+0.1,y01+0.1,y07+0.9,y07+0.9];

xcable13=[1.45,1.55,1.55,1.45];
ycable13=[-4.9,-4.9,y07-0.9,y07-0.9];

xcable14=[1.45,1.55,1.55,1.45]+5.0;
ycable14=[y01+0.1,y01+0.1,y07+0.9,y07+0.9];

xcable15=[1.45,1.55,1.55,1.45]+5.0;
ycable15=[-4.9,-4.9,y07-0.9,y07-0.9];

*****
fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_41,yres_41,[1.0,1.0,1.0],...
xres_42,yres_42,[0.0,0.0,0.0],...
xres_51,yres_51,[1.0,1.0,1.0],...
xres_52,yres_52,[0.0,0.0,0.0],...
xI1_1,yI1_1,[0.0,0.0,0.0],...
xI1_2,yI1_2,[1.0,1.0,1.0],...
xI1_3,yI1_3,[0.0,0.0,0.0],...
xI2_1,yI2_1,[0.0,0.0,0.0],...
xI2_2,yI2_2,[1.0,1.0,1.0],...
xI2_3,yI2_3,[0.0,0.0,0.0],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable12,ycable12,[0.8,0.6,0.2],...

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xcable13,ycable13,[0.8,0.6,0.2],...
xcable14,ycable14,[0.8,0.6,0.2],...
xcable15,ycable15,[0.8,0.6,0.2],...
    'LineStyle','None')

text(-11,11,'Υπολογίζουμε μετά το ισοδύναμο κατά Thevenin από τα άκρα (b,d). Ανοίγουμε τις πηγές ρεύματος')
text(-11,10,'και η ισοδύναμη αντίσταση Thevenin θα είναι  $R_{T2}=R_{4}+R_{5}$ =')
    text(0.0,10.1,nRT2)
    text(0.7,10.1,'Ohm')
text(3.5,6.5,'R_4','Color',[0.9,0.2,0.0])
text(9.5,0.7,'R_5','Color',[0.9,0.2,0.0])
text(0.5,0.0,'I_1','Color',[0.0,0.4,0.4])
text(5.5,0.0,'I_2','Color',[0.0,0.4,0.4])
text(x03+1.2,5.5,'b','Color',[0.1,0.1,0.1])
text(x03+1.2,-5.5,'d','Color',[0.1,0.1,0.1])
    text(6.25,5.5,'e','Color',[0.1,0.1,0.1])

axis([-12,12,-12,12])
axis off;
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
elseif (snmeio==4)
axes(handles.axes1);
cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,8,8];

x01=-8;
y01=5;
th1=0;

x02=-4;
y02=0;
th2=pi/2;

x03=-1.5;
y03=5;
th3=0;

x04=3;
y04=5;
th4=0;

xres_41=x04+[0.40*sin(th4),0.40*sin(th4)+1.2*cos(th4),...
-0.40*sin(th4)+1.2*cos(th4),-0.40*sin(th4)];
yres_41=y04+[-0.40*cos(th4),-0.40*cos(th4)+1.2*sin(th4),...
0.40*cos(th4)+1.2*sin(th4),0.40*cos(th4)];

xres_42=x04+[-0.05*sin(th4),-0.05*sin(th4)+0.25*cos(th4),...
-0.40*sin(th4)+0.3*cos(th4),...
0.25*sin(th4)+0.45*cos(th4),...
-0.40*sin(th4)+0.6*cos(th4),...
0.25*sin(th4)+0.75*cos(th4),...
-0.40*sin(th4)+0.9*cos(th4),...
-0.05*sin(th4)+0.95*cos(th4),...
-0.05*sin(th4)+1.2*cos(th4),...
0.05*sin(th4)+1.2*cos(th4),...
0.05*sin(th4)+0.95*cos(th4),...
-0.25*sin(th4)+0.9*cos(th4),...
0.40*sin(th4)+0.75*cos(th4),...
-0.25*sin(th4)+0.6*cos(th4),...
0.40*sin(th4)+0.45*cos(th4),...
-0.25*sin(th4)+0.3*cos(th4),...
0.05*sin(th4)+0.25*cos(th4),...
0.05*sin(th4)];
yres_42=y04+[0.05*cos(th4),0.05*cos(th4)+0.25*sin(th4),...
0.40*cos(th4)+0.3*sin(th4),...
-0.25*cos(th4)+0.45*sin(th4),...
0.40*cos(th4)+0.6*sin(th4),...
-0.25*cos(th4)+0.75*sin(th4),...
0.40*cos(th4)+0.9*sin(th4),...
0.05*cos(th4)+0.95*sin(th4),...
0.05*cos(th4)+1.2*sin(th4),...
-0.05*cos(th4)+1.2*sin(th4),...

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-0.05*cos(th4)+0.95*sin(th4),...
0.25*cos(th4)+0.9*sin(th4),...
-0.40*cos(th4)+0.75*sin(th4),...
0.25*cos(th4)+0.6*sin(th4),...
-0.40*cos(th4)+0.45*sin(th4),...
0.25*cos(th4)+0.3*sin(th4),...
-0.05*cos(th4)+0.25*sin(th4),...
-0.05*cos(th4)];

x05=9;
y05=0;
th5=pi/2;

xres_51=x05+[0.25*sin(th5),0.25*sin(th5)+1.6*cos(th5),...
-0.25*sin(th5)+1.6*cos(th5),-0.25*sin(th5)];
yres_51=y05+[-0.25*cos(th5),-0.25*cos(th5)+1.6*sin(th5),...
0.25*cos(th5)+1.6*sin(th5),0.25*cos(th5)];

xres_52=x05+[-0.03*sin(th5),-0.03*sin(th5)+0.33*cos(th5),...
-0.25*sin(th5)+0.4*cos(th5),...
0.10*sin(th5)+0.6*cos(th5),...
-0.25*sin(th5)+0.8*cos(th5),...
0.10*sin(th5)+1.0*cos(th5),...
-0.25*sin(th5)+1.2*cos(th5),...
-0.03*sin(th5)+1.27*cos(th5),...
-0.03*sin(th5)+1.6*cos(th5),...
0.03*sin(th5)+1.6*cos(th5),...
0.03*sin(th5)+1.27*cos(th5),...
-0.10*sin(th5)+1.2*cos(th5),...
0.25*sin(th5)+1.0*cos(th5),...
-0.10*sin(th5)+0.8*cos(th5),...
0.25*sin(th5)+0.6*cos(th5),...
-0.10*sin(th5)+0.4*cos(th5),...
0.03*sin(th5)+0.33*cos(th5),...
0.03*sin(th5)];
yres_52=y05+[0.03*cos(th5),0.03*cos(th5)+0.33*sin(th5),...
0.25*cos(th5)+0.4*sin(th5),...
-0.10*cos(th5)+0.6*sin(th5),...
0.25*cos(th5)+0.8*sin(th5),...
-0.10*cos(th5)+1.0*sin(th5),...
0.25*cos(th5)+1.2*sin(th5),...
0.03*cos(th5)+1.27*sin(th5),...
0.03*cos(th5)+1.6*sin(th5),...
-0.03*cos(th5)+1.6*sin(th5),...
-0.03*cos(th5)+1.27*sin(th5),...
0.10*cos(th5)+1.2*sin(th5),...
-0.25*cos(th5)+1.0*sin(th5),...
0.10*cos(th5)+0.8*sin(th5),...
-0.25*cos(th5)+0.6*sin(th5),...
0.10*cos(th5)+0.4*sin(th5),...
-0.03*cos(th5)+0.33*sin(th5),...
-0.03*cos(th5)];
x06=-9.5;
y06=0;

x07=1.5;
y07=0;
phi7=0:0.01:2*pi;

xI1_1=x07+0.6*cos(phi7);
yI1_1=y07+0.9*sin(phi7);

xI1_2=x07+0.55*cos(phi7);
yI1_2=y07+0.85*sin(phi7);

xI1_3=x07+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI1_3=y07+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

x08=6.5;
y08=0;
phi8=0:0.01:2*pi;

xI2_1=x08+0.6*cos(phi8);
yI2_1=y08+0.9*sin(phi8);

xI2_2=x08+0.55*cos(phi8);
yI2_2=y08+0.85*sin(phi8);

xI2_3=x08+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];

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```

yI2_3=y08+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

xcable4=[x03-1.2,x03-1.2,9,9];
ycable4=-5.0+[0.1,-0.1,-0.1,0.1];

xcable5=[8.95,9.05,9.05,8.95];
ycable5=[-4.9,-4.9,0.0,0.0];

xcable6=[8.95,9.05,9.05,8.95];
ycable6=[4.9,4.9,1.6,1.6];

xcable7=[x04+1.2,x04+1.2,9.05,9.05];
ycable7=y01+[0.1,-0.1,-0.1,0.1];

xcable8=[x04,x04,x03-1.2,x03-1.2];
ycable8=y01+[0.1,-0.1,-0.1,0.1];

xcable12=[1.45,1.55,1.55,1.45];
ycable12=[y01+0.1,y01+0.1,y07+0.9,y07+0.9];

xcable13=[1.45,1.55,1.55,1.45];
ycable13=[-4.9,-4.9,y07-0.9,y07-0.9];

xcable14=[1.45,1.55,1.55,1.45]+5.0;
ycable14=[y01+0.1,y01+0.1,y07+0.9,y07+0.9];

xcable15=[1.45,1.55,1.55,1.45]+5.0;
ycable15=[-4.9,-4.9,y07-0.9,y07-0.9];

xcable16=[x03-1.2,x03-1.3,x03-1.3,x03-1.2];
ycable16=[y01+0.1,y01+0.1,-5.1,-5.1];

xIN2=x03+[-1.2,-1.3,-1.3,-1.5,-1.25,-1.0,-1.2];
yIN2=[0.0,0.0,-2.0,-2.0,-2.5,-2.0,-2.0];

xJ1=6.5+[0.0,0.0,-1.0,-1.0,-1.3,-1.0,-1.0];
yJ1=y01+[-0.1,0.1,0.1,0.3,0.0,-0.3,-0.1];
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_41,yres_41,[1.0,1.0,1.0],...
xres_42,yres_42,[0.0,0.0,0.0],...
xres_51,yres_51,[1.0,1.0,1.0],...
xres_52,yres_52,[0.0,0.0,0.0],...
xI1_1,yI1_1,[0.0,0.0,0.0],...
xI1_2,yI1_2,[1.0,1.0,1.0],...
xI1_3,yI1_3,[0.0,0.0,0.0],...
xI2_1,yI2_1,[0.0,0.0,0.0],...
xI2_2,yI2_2,[1.0,1.0,1.0],...
xI2_3,yI2_3,[0.0,0.0,0.0],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable12,ycable12,[0.8,0.6,0.2],...
xcable13,ycable13,[0.8,0.6,0.2],...
xcable14,ycable14,[0.8,0.6,0.2],...
xcable15,ycable15,[0.8,0.6,0.2],...
xcable16,ycable16,[0.8,0.6,0.2],...
xIN2,yIN2,[0.0,0.0,0.0],...
xJ1,yJ1,[0.0,0.0,0.0],...
'Linestyle','None')

text(-11,11,'Βραχυκυκλώνουμε τα άκρα (b,d) και υπολογίζουμε το ρεύμα βραχυκύκλωσης I_{N2}. Η τάση στον κόμβο b,
λόγω βραχυκύκλωσης')
text(-11,10,'είναι μηδέν οπότε από τον κόμβο e έχουμε (V_{e}/R_{5})+(V_{e}/R_{4})=I_{2}, οπότε V_{e}=')
text(2,10,nVe)
text(2.8,10,'Volt. Το ρεύμα βραχυκύκλωσης είναι')
text(-11,9,'I_{N2}=I_{1}+J_{1}=I_{1}+(V_{e}/R_{4})=')
text(-6.7,9.1,nIN2)
text(-5.9,9,'Α. Άρα η τάση Thevenin θα είναι V_{T2}=I_{N2}R_{T2}=')
text(3,9,nVT2)
text(3.5,9,'Volt')

text(3.5,6.5,'R_{4}','Color',[0.9,0.2,0.0])
text(9.5,0.7,'R_{5}','Color',[0.9,0.2,0.0])
text(0.5,0.0,'I_{1}','Color',[0.0,0.4,0.4])
text(5.5,0.0,'I_{2}','Color',[0.0,0.4,0.4])
text(x03-1.2,5.5,'b','Color',[0.1,0.1,0.1])
text(x03-1.2,-5.5,'d','Color',[0.1,0.1,0.1])

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text(6.25,5.5,'e','Color',[0.1,0.1,0.1])
text(x03-2.5,0.0,'I_{N2}','Color',[0.0,0.4,0.4])
text(5.5,5.5,'J_1','Color',[0.0,0.4,0.4])

axis([-12,12,-12,12])
axis off;
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

elseif (snmeio==5)
axes(handles.axes1);
cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,9,9];

x01=-8;
y01=5;
th1=0;

xres_11=x01+[0.40*sin(th1),0.40*sin(th1)+1.2*cos(th1),...
-0.40*sin(th1)+1.2*cos(th1),-0.40*sin(th1)];
yres_11=y01+[-0.40*cos(th1),-0.40*cos(th1)+1.2*sin(th1),...
0.40*cos(th1)+1.2*sin(th1),0.40*cos(th1)];

xres_12=x01+[-0.05*sin(th1),-0.05*sin(th1)+0.25*cos(th1),...
-0.40*sin(th1)+0.3*cos(th1),...
0.25*sin(th1)+0.45*cos(th1),...
-0.40*sin(th1)+0.6*cos(th1),...
0.25*sin(th1)+0.75*cos(th1),...
-0.40*sin(th1)+0.9*cos(th1),...
-0.05*sin(th1)+0.95*cos(th1),...
-0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+0.95*cos(th1),...
-0.25*sin(th1)+0.9*cos(th1),...
0.40*sin(th1)+0.75*cos(th1),...
-0.25*sin(th1)+0.6*cos(th1),...
0.40*sin(th1)+0.45*cos(th1),...
-0.25*sin(th1)+0.3*cos(th1),...
0.05*sin(th1)+0.25*cos(th1),...
0.05*sin(th1)];
yres_12=y01+[0.05*cos(th1),0.05*cos(th1)+0.25*sin(th1),...
0.40*cos(th1)+0.3*sin(th1),...
-0.25*cos(th1)+0.45*sin(th1),...
0.40*cos(th1)+0.6*sin(th1),...
-0.250*cos(th1)+0.75*sin(th1),...
0.40*cos(th1)+0.9*sin(th1),...
0.05*cos(th1)+0.95*sin(th1),...
0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+0.95*sin(th1),...
0.25*cos(th1)+0.9*sin(th1),...
-0.40*cos(th1)+0.75*sin(th1),...
0.25*cos(th1)+0.6*sin(th1),...
-0.40*cos(th1)+0.45*sin(th1),...
0.25*cos(th1)+0.3*sin(th1),...
-0.05*cos(th1)+0.25*sin(th1),...
-0.05*cos(th1)];

x02=-4;
y02=0;
th2=pi/2;

x03=-1.5;
y03=5;
th3=0;

xres_31=x03+[0.40*sin(th3),0.40*sin(th3)+1.2*cos(th3),...
-0.40*sin(th3)+1.2*cos(th3),-0.40*sin(th3)];
yres_31=y03+[-0.40*cos(th3),-0.40*cos(th3)+1.2*sin(th3),...
0.40*cos(th3)+1.2*sin(th3),0.40*cos(th3)];

xres_32=x03+[-0.05*sin(th3),-0.05*sin(th3)+0.25*cos(th3),...
-0.40*sin(th3)+0.3*cos(th3),...
0.25*sin(th3)+0.45*cos(th3),...
-0.40*sin(th3)+0.6*cos(th3),...

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0.25*sin(th3)+0.75*cos(th3),...
-0.40*sin(th3)+0.9*cos(th3),...
-0.05*sin(th3)+0.95*cos(th3),...
-0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+0.95*cos(th3),...
-0.25*sin(th3)+0.9*cos(th3),...
0.40*sin(th3)+0.75*cos(th3),...
-0.25*sin(th3)+0.6*cos(th3),...
0.40*sin(th3)+0.45*cos(th3),...
-0.25*sin(th3)+0.3*cos(th3),...
0.05*sin(th3)+0.25*cos(th3),...
0.05*sin(th3)];
yres_32=y03+[0.05*cos(th3),0.05*cos(th3)+0.25*sin(th3),...
0.40*cos(th3)+0.3*sin(th3),...
-0.25*cos(th3)+0.45*sin(th3),...
0.40*cos(th3)+0.6*sin(th3),...
-0.250*cos(th3)+0.75*sin(th3),...
0.40*cos(th3)+0.9*sin(th3),...
0.05*cos(th3)+0.95*sin(th3),...
0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+0.95*sin(th3),...
0.25*cos(th3)+0.9*sin(th3),...
-0.40*cos(th3)+0.75*sin(th3),...
0.25*cos(th3)+0.6*sin(th3),...
-0.40*cos(th3)+0.45*sin(th3),...
0.25*cos(th3)+0.3*sin(th3),...
-0.05*cos(th3)+0.25*sin(th3),...
-0.05*cos(th3)];

x04=3;
y04=5;
th4=0;

xres_41=x04+[0.40*sin(th4),0.40*sin(th4)+1.2*cos(th4),...
-0.40*sin(th4)+1.2*cos(th4),-0.40*sin(th4)];
yres_41=y04+[-0.40*cos(th4),-0.40*cos(th4)+1.2*sin(th4),...
0.40*cos(th4)+1.2*sin(th4),0.40*cos(th4)];

xres_42=x04+[-0.05*sin(th4),-0.05*sin(th4)+0.25*cos(th4),...
-0.40*sin(th4)+0.3*cos(th4),...
0.25*sin(th4)+0.45*cos(th4),...
-0.40*sin(th4)+0.6*cos(th4),...
0.25*sin(th4)+0.75*cos(th4),...
-0.40*sin(th4)+0.9*cos(th4),...
-0.05*sin(th4)+0.95*cos(th4),...
-0.05*sin(th4)+1.2*cos(th4),...
0.05*sin(th4)+1.2*cos(th4),...
0.05*sin(th4)+0.95*cos(th4),...
-0.25*sin(th4)+0.9*cos(th4),...
0.40*sin(th4)+0.75*cos(th4),...
-0.25*sin(th4)+0.6*cos(th4),...
0.40*sin(th4)+0.45*cos(th4),...
-0.25*sin(th4)+0.3*cos(th4),...
0.05*sin(th4)+0.25*cos(th4),...
0.05*sin(th4)];
yres_42=y04+[0.05*cos(th4),0.05*cos(th4)+0.25*sin(th4),...
0.40*cos(th4)+0.3*sin(th4),...
-0.25*cos(th4)+0.45*sin(th4),...
0.40*cos(th4)+0.6*sin(th4),...
-0.250*cos(th4)+0.75*sin(th4),...
0.40*cos(th4)+0.9*sin(th4),...
0.05*cos(th4)+0.95*sin(th4),...
0.05*cos(th4)+1.2*sin(th4),...
-0.05*cos(th4)+1.2*sin(th4),...
-0.05*cos(th4)+0.95*sin(th4),...
0.25*cos(th4)+0.9*sin(th4),...
-0.40*cos(th4)+0.75*sin(th4),...
0.25*cos(th4)+0.6*sin(th4),...
-0.40*cos(th4)+0.45*sin(th4),...
0.25*cos(th4)+0.3*sin(th4),...
-0.05*cos(th4)+0.25*sin(th4),...
-0.05*cos(th4)];

x05=9;
y05=0;
th5=pi/2;

```

```

x06=-9.5;
y06=0;

xv1_1=x06+[-1.0,1.0,1.0,-1.0];
yv1_1=y06+[-0.05,-0.05,0.05,0.05]+0.3;

xv1_2=x06+[-0.4,0.4,0.4,-0.4];
yv1_2=y06+[-0.1,-0.1,0.1,0.1]-0.1;

x07=1.5;
y07=0;
phi7=0:0.01:2*pi;

x08=6.5;
y08=0;
phi8=0:0.01:2*pi;

x09=9.0;
y09=0.2;

xv2_1=x09+[-1.0,1.0,1.0,-1.0];
yv2_1=y09+[-0.05,-0.05,0.05,0.05]+0.3;

xv2_2=x09+[-0.4,0.4,0.4,-0.4];
yv2_2=y09+[-0.1,-0.1,0.1,0.1]-0.1;

xcable1=[-9.5,-9.5,-8,-8];
ycable1=y01+[0.1,-0.1,-0.1,0.1];

xcable2=[-9.55,-9.45,-9.45,-9.55];
ycable2=[y01+0.1,y01+0.1,y06+0.4,y06+0.4];

xcable3=[-9.55,-9.45,-9.45,-9.55];
ycable3=[y06-0.2,y06-0.2,-5.0,-5.0];

xcable4=[-9.5,-9.5,9,9];
ycable4=-5.0+[0.1,-0.1,-0.1,0.1];

xcable5=[8.95,9.05,9.05,8.95];
ycable5=[-4.9,-4.9,0.0,0.0];

xcable6=[8.95,9.05,9.05,8.95];
ycable6=[4.9,4.9,0.6,0.6];

xcable7=[x04+1.2,x04+1.2,9.05,9.05];
ycable7=y01+[0.1,-0.1,-0.1,0.1];

xcable8=[x04,x04,x03+1.2,x03+1.2];
ycable8=y01+[0.1,-0.1,-0.1,0.1];

xcable9=[x03,x03,x01+1.2,x01+1.2];
ycable9=y01+[0.1,-0.1,-0.1,0.1];

xcurr=1.0+[-3.95,-3.45,-3.45,-3.25,-3.45,-3.45,-3.95];
ycurr=y01+[0.1,0.1,0.3,0.0,-0.3,-0.1,-0.1];

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_11,yres_11,[1.0,1.0,1.0],...
xres_12,yres_12,[0.0,0.0,0.0],...
xres_31,yres_31,[1.0,1.0,1.0],...
xres_32,yres_32,[0.0,0.0,0.0],...
xres_41,yres_41,[1.0,1.0,1.0],...
xres_42,yres_42,[0.0,0.0,0.0],...
xv1_1,yv1_1,[0.0,0.0,0.0],...
xv1_2,yv1_2,[0.0,0.0,0.0],...
xv2_1,yv2_1,[0.0,0.0,0.0],...
xv2_2,yv2_2,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
xcurr,ycurr,[0.0,0.0,0.0],...

```

```

        'LineStyle','None')
text(-11,11,'Προκύπτει συνεπώς το παρακάτω ισοδύναμο του αρχικού κυκλώματος. Θα έχουμε')
text(-11,10,'V_{T1}-IR_{T1}-IR_{3}-IR_{T2}-V_{T2}=0, οπότε I=')
text(-4.8,10.1,nI)
text(-3.8,10.1,'A.')
```

```

text(-7.5,6.5,'R_{T1}','Color',[0.9,0.2,0.0])
text(-1.0,6.5,'R_3','Color',[0.9,0.2,0.0])
text(3.5,6.5,'R_{T2}','Color',[0.9,0.2,0.0])
text(-10.5,1.0,'V_{T1}','Color',[0.0,0.2,0.9])
text(9.5,1.0,'V_{T2}','Color',[0.0,0.2,0.9])
text(-4.25,5.5,'a','Color',[0.1,0.1,0.1])
text(-4.25,-5.5,'c','Color',[0.1,0.1,0.1])
text(1.25,5.5,'b','Color',[0.1,0.1,0.1])
text(1.25,-5.5,'d','Color',[0.1,0.1,0.1])
text(-2.8,6.0,'I','Color',[0.1,0.1,0.1])

axis([-12,12,-12,12])
axis off;
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

else
end

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

% --- Executes on button press in pushbutton3.
function pushbutton3_Callback(hObject, eventdata, handles)
% hObject handle to pushbutton3 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
global R1;
global R2;
global R3;
global R4;
global R5;
global V1;
global I1;
global I2;

global snmeio;

snmeio=snmeio-1;

if (snmeio==0)
snmeio=5;
end

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
RT1=R1*R2/(R1+R2);
VT1=V1*R2/(R1+R2);
nRT1=num2str(0.01*round(100*RT1));
nVT1=num2str(0.01*round(100*VT1));
RT2=R4+R5;
nRT2=num2str(0.01*round(100*RT2));
Ve=I2*R4*R5/(R4+R5);
nVe=num2str(0.01*round(100*Ve));
IN2=I1+(Ve/R4);
nIN2=num2str(0.01*round(100*IN2));
VT2=IN2*RT2;
nVT2=num2str(0.01*round(100*VT2));
I=(VT1-VT2)/(RT1+RT2+R3);
nI=num2str(0.01*round(100*I));
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
if (snmeio==1)
axes(handles.axes1);
cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,9,9];

x01=-8;
y01=5;

```

```

th1=0;

xres_11=x01+[0.40*sin(th1),0.40*sin(th1)+1.2*cos(th1),...
-0.40*sin(th1)+1.2*cos(th1),-0.40*sin(th1)];
yres_11=y01+[-0.40*cos(th1),-0.40*cos(th1)+1.2*sin(th1),...
0.40*cos(th1)+1.2*sin(th1),0.40*cos(th1)];

xres_12=x01+[-0.05*sin(th1),-0.05*sin(th1)+0.25*cos(th1),...
-0.40*sin(th1)+0.3*cos(th1),...
0.25*sin(th1)+0.45*cos(th1),...
-0.40*sin(th1)+0.6*cos(th1),...
0.25*sin(th1)+0.75*cos(th1),...
-0.40*sin(th1)+0.9*cos(th1),...
-0.05*sin(th1)+0.95*cos(th1),...
-0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+0.95*cos(th1),...
-0.25*sin(th1)+0.9*cos(th1),...
0.40*sin(th1)+0.75*cos(th1),...
-0.25*sin(th1)+0.6*cos(th1),...
0.40*sin(th1)+0.45*cos(th1),...
-0.25*sin(th1)+0.3*cos(th1),...
0.05*sin(th1)+0.25*cos(th1),...
0.05*sin(th1)];
yres_12=y01+[0.05*cos(th1),0.05*cos(th1)+0.25*sin(th1),...
0.40*cos(th1)+0.3*sin(th1),...
-0.25*cos(th1)+0.45*sin(th1),...
0.40*cos(th1)+0.6*sin(th1),...
-0.250*cos(th1)+0.75*sin(th1),...
0.40*cos(th1)+0.9*sin(th1),...
0.05*cos(th1)+0.95*sin(th1),...
0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+0.95*sin(th1),...
0.25*cos(th1)+0.9*sin(th1),...
-0.40*cos(th1)+0.75*sin(th1),...
0.25*cos(th1)+0.6*sin(th1),...
-0.40*cos(th1)+0.45*sin(th1),...
0.25*cos(th1)+0.3*sin(th1),...
-0.05*cos(th1)+0.25*sin(th1),...
-0.05*cos(th1)];

x02=-4;
y02=0;
th2=pi/2;

xres_21=x02+[0.25*sin(th2),0.25*sin(th2)+1.6*cos(th2),...
-0.25*sin(th2)+1.6*cos(th2),-0.25*sin(th2)];
yres_21=y02+[-0.25*cos(th2),-0.25*cos(th2)+1.6*sin(th2),...
0.25*cos(th2)+1.6*sin(th2),0.25*cos(th2)];

xres_22=x02+[-0.03*sin(th2),-0.03*sin(th2)+0.33*cos(th2),...
-0.25*sin(th2)+0.4*cos(th2),...
0.10*sin(th2)+0.6*cos(th2),...
-0.25*sin(th2)+0.8*cos(th2),...
0.10*sin(th2)+1.0*cos(th2),...
-0.25*sin(th2)+1.2*cos(th2),...
-0.03*sin(th2)+1.27*cos(th2),...
-0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.27*cos(th2),...
-0.10*sin(th2)+1.2*cos(th2),...
0.25*sin(th2)+1.0*cos(th2),...
-0.10*sin(th2)+0.8*cos(th2),...
0.25*sin(th2)+0.6*cos(th2),...
-0.10*sin(th2)+0.4*cos(th2),...
0.03*sin(th2)+0.33*cos(th2),...
0.03*sin(th2)];
yres_22=y02+[0.03*cos(th2),0.03*cos(th2)+0.33*sin(th2),...
0.25*cos(th2)+0.4*sin(th2),...
-0.10*cos(th2)+0.6*sin(th2),...
0.25*cos(th2)+0.8*sin(th2),...
-0.10*cos(th2)+1.0*sin(th2),...
0.25*cos(th2)+1.2*sin(th2),...
0.03*cos(th2)+1.27*sin(th2),...
0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.27*sin(th2),...
0.10*cos(th2)+1.2*sin(th2),...
-0.25*cos(th2)+1.0*sin(th2),...

```

```

0.10*cos(th2)+0.8*sin(th2),...
-0.25*cos(th2)+0.6*sin(th2),...
0.10*cos(th2)+0.4*sin(th2),...
-0.03*cos(th2)+0.33*sin(th2),...
-0.03*cos(th2)];

x03=-1.5;
y03=5;
th3=0;

xres_31=x03+[0.40*sin(th3),0.40*sin(th3)+1.2*cos(th3),...
-0.40*sin(th3)+1.2*cos(th3),-0.40*sin(th3)];
yres_31=y03+[-0.40*cos(th3),-0.40*cos(th3)+1.2*sin(th3),...
0.40*cos(th3)+1.2*sin(th3),0.40*cos(th3)];

xres_32=x03+[-0.05*sin(th3),-0.05*sin(th3)+0.25*cos(th3),...
-0.40*sin(th3)+0.3*cos(th3),...
0.25*sin(th3)+0.45*cos(th3),...
-0.40*sin(th3)+0.6*cos(th3),...
0.25*sin(th3)+0.75*cos(th3),...
-0.40*sin(th3)+0.9*cos(th3),...
-0.05*sin(th3)+0.95*cos(th3),...
-0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+0.95*cos(th3),...
-0.25*sin(th3)+0.9*cos(th3),...
0.40*sin(th3)+0.75*cos(th3),...
-0.25*sin(th3)+0.6*cos(th3),...
0.40*sin(th3)+0.45*cos(th3),...
-0.25*sin(th3)+0.3*cos(th3),...
0.05*sin(th3)+0.25*cos(th3),...
0.05*sin(th3)];
yres_32=y03+[0.05*cos(th3),0.05*cos(th3)+0.25*sin(th3),...
0.40*cos(th3)+0.3*sin(th3),...
-0.25*cos(th3)+0.45*sin(th3),...
0.40*cos(th3)+0.6*sin(th3),...
-0.250*cos(th3)+0.75*sin(th3),...
0.40*cos(th3)+0.9*sin(th3),...
0.05*cos(th3)+0.95*sin(th3),...
0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+0.95*sin(th3),...
0.25*cos(th3)+0.9*sin(th3),...
-0.40*cos(th3)+0.75*sin(th3),...
0.25*cos(th3)+0.6*sin(th3),...
-0.40*cos(th3)+0.45*sin(th3),...
0.25*cos(th3)+0.3*sin(th3),...
-0.05*cos(th3)+0.25*sin(th3),...
-0.05*cos(th3)];

x04=3;
y04=5;
th4=0;

xres_41=x04+[0.40*sin(th4),0.40*sin(th4)+1.2*cos(th4),...
-0.40*sin(th4)+1.2*cos(th4),-0.40*sin(th4)];
yres_41=y04+[-0.40*cos(th4),-0.40*cos(th4)+1.2*sin(th4),...
0.40*cos(th4)+1.2*sin(th4),0.40*cos(th4)];

xres_42=x04+[-0.05*sin(th4),-0.05*sin(th4)+0.25*cos(th4),...
-0.40*sin(th4)+0.3*cos(th4),...
0.25*sin(th4)+0.45*cos(th4),...
-0.40*sin(th4)+0.6*cos(th4),...
0.25*sin(th4)+0.75*cos(th4),...
-0.40*sin(th4)+0.9*cos(th4),...
-0.05*sin(th4)+0.95*cos(th4),...
-0.05*sin(th4)+1.2*cos(th4),...
0.05*sin(th4)+1.2*cos(th4),...
0.05*sin(th4)+0.95*cos(th4),...
-0.25*sin(th4)+0.9*cos(th4),...
0.40*sin(th4)+0.75*cos(th4),...
-0.25*sin(th4)+0.6*cos(th4),...
0.40*sin(th4)+0.45*cos(th4),...
-0.25*sin(th4)+0.3*cos(th4),...
0.05*sin(th4)+0.25*cos(th4),...
0.05*sin(th4)];
yres_42=y04+[0.05*cos(th4),0.05*cos(th4)+0.25*sin(th4),...
0.40*cos(th4)+0.3*sin(th4),...
-0.25*cos(th4)+0.45*sin(th4),...

```



```

0.40*cos(th4)+0.6*sin(th4),...
-0.250*cos(th4)+0.75*sin(th4),...
0.40*cos(th4)+0.9*sin(th4),...
0.05*cos(th4)+0.95*sin(th4),...
0.05*cos(th4)+1.2*sin(th4),...
-0.05*cos(th4)+1.2*sin(th4),...
-0.05*cos(th4)+0.95*sin(th4),...
0.25*cos(th4)+0.9*sin(th4),...
-0.40*cos(th4)+0.75*sin(th4),...
0.25*cos(th4)+0.6*sin(th4),...
-0.40*cos(th4)+0.45*sin(th4),...
0.25*cos(th4)+0.3*sin(th4),...
-0.05*cos(th4)+0.25*sin(th4),...
-0.05*cos(th4)];

x05=9;
y05=0;
th5=pi/2;

xres_51=x05+[0.25*sin(th5),0.25*sin(th5)+1.6*cos(th5),...
-0.25*sin(th5)+1.6*cos(th5),-0.25*sin(th5)];
yres_51=y05+[-0.25*cos(th5),-0.25*cos(th5)+1.6*sin(th5),...
0.25*cos(th5)+1.6*sin(th5),0.25*cos(th5)];

xres_52=x05+[-0.03*sin(th5),-0.03*sin(th5)+0.33*cos(th5),...
-0.25*sin(th5)+0.4*cos(th5),...
0.10*sin(th5)+0.6*cos(th5),...
-0.25*sin(th5)+0.8*cos(th5),...
0.10*sin(th5)+1.0*cos(th5),...
-0.25*sin(th5)+1.2*cos(th5),...
-0.03*sin(th5)+1.27*cos(th5),...
-0.03*sin(th5)+1.6*cos(th5),...
0.03*sin(th5)+1.6*cos(th5),...
0.03*sin(th5)+1.27*cos(th5),...
-0.10*sin(th5)+1.2*cos(th5),...
0.25*sin(th5)+1.0*cos(th5),...
-0.10*sin(th5)+0.8*cos(th5),...
0.25*sin(th5)+0.6*cos(th5),...
-0.10*sin(th5)+0.4*cos(th5),...
0.03*sin(th5)+0.33*cos(th5),...
0.03*sin(th5)];
yres_52=y05+[0.03*cos(th5),0.03*cos(th5)+0.33*sin(th5),...
0.25*cos(th5)+0.4*sin(th5),...
-0.10*cos(th5)+0.6*sin(th5),...
0.25*cos(th5)+0.8*sin(th5),...
-0.10*cos(th5)+1.0*sin(th5),...
0.25*cos(th5)+1.2*sin(th5),...
0.03*cos(th5)+1.27*sin(th5),...
0.03*cos(th5)+1.6*sin(th5),...
-0.03*cos(th5)+1.6*sin(th5),...
-0.03*cos(th5)+1.27*sin(th5),...
0.10*cos(th5)+1.2*sin(th5),...
-0.25*cos(th5)+1.0*sin(th5),...
0.10*cos(th5)+0.8*sin(th5),...
-0.25*cos(th5)+0.6*sin(th5),...
0.10*cos(th5)+0.4*sin(th5),...
-0.03*cos(th5)+0.33*sin(th5),...
-0.03*cos(th5)];

x06=-9.5;
y06=0;

xv1_1=x06+[-1.0,1.0,1.0,-1.0];
yv1_1=y06+[-0.05,-0.05,0.05,0.05]+0.3;

xv1_2=x06+[-0.4,0.4,0.4,-0.4];
yv1_2=y06+[-0.1,-0.1,0.1,0.1]-0.1;

x07=1.5;
y07=0;
phi7=0:0.01:2*pi;

xI1_1=x07+0.6*cos(phi7);
yI1_1=y07+0.9*sin(phi7);

xI1_2=x07+0.55*cos(phi7);
yI1_2=y07+0.85*sin(phi7);

xI1_3=x07+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];

```

```

yI1_3=y07+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

x08=6.5;
y08=0;
phi8=0:0.01:2*pi;

xI2_1=x08+0.6*cos(phi8);
yI2_1=y08+0.9*sin(phi8);

xI2_2=x08+0.55*cos(phi8);
yI2_2=y08+0.85*sin(phi8);

xI2_3=x08+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI2_3=y08+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

xcable1=[-9.5,-9.5,-8,-8];
ycable1=y01+[0.1,-0.1,-0.1,0.1];

xcable2=[-9.55,-9.45,-9.45,-9.55];
ycable2=[y01+0.1,y01+0.1,y06+0.4,y06+0.4];

xcable3=[-9.55,-9.45,-9.45,-9.55];
ycable3=[y06-0.2,y06-0.2,-5.0,-5.0];

xcable4=[-9.5,-9.5,9,9];
ycable4=-5.0+[0.1,-0.1,-0.1,0.1];

xcable5=[8.95,9.05,9.05,8.95];
ycable5=[-4.9,-4.9,0.0,0.0];

xcable6=[8.95,9.05,9.05,8.95];
ycable6=[4.9,4.9,1.6,1.6];

xcable7=[x04+1.2,x04+1.2,9.05,9.05];
ycable7=y01+[0.1,-0.1,-0.1,0.1];

xcable8=[x04,x04,x03+1.2,x03+1.2];
ycable8=y01+[0.1,-0.1,-0.1,0.1];

xcable9=[x03,x03,x01+1.2,x01+1.2];
ycable9=y01+[0.1,-0.1,-0.1,0.1];

xcable10=[-3.95,-4.05,-4.05,-3.95];
ycable10=[y01+0.1,y01+0.1,y02+1.6,y02+1.6];

xcable11=[-3.95,-4.05,-4.05,-3.95];
ycable11=[-4.9,-4.9,y02,y02];

xcable12=[1.45,1.55,1.55,1.45];
ycable12=[y01+0.1,y01+0.1,y07+0.9,y07+0.9];

xcable13=[1.45,1.55,1.55,1.45];
ycable13=[-4.9,-4.9,y07-0.9,y07-0.9];

xcable14=[1.45,1.55,1.55,1.45]+5.0;
ycable14=[y01+0.1,y01+0.1,y07+0.9,y07+0.9];

xcable15=[1.45,1.55,1.55,1.45]+5.0;
ycable15=[-4.9,-4.9,y07-0.9,y07-0.9];

xcurr=1.0+[-3.95,-3.45,-3.45,-3.25,-3.45,-3.45,-3.95];
ycurr=y01+[0.1,0.1,0.3,0.0,-0.3,-0.1,-0.1];

```

```

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_11,yres_11,[1.0,1.0,1.0],...
xres_12,yres_12,[0.0,0.0,0.0],...
xres_21,yres_21,[1.0,1.0,1.0],...
xres_22,yres_22,[0.0,0.0,0.0],...
xres_31,yres_31,[1.0,1.0,1.0],...
xres_32,yres_32,[0.0,0.0,0.0],...
xres_41,yres_41,[1.0,1.0,1.0],...
xres_42,yres_42,[0.0,0.0,0.0],...
xres_51,yres_51,[1.0,1.0,1.0],...
xres_52,yres_52,[0.0,0.0,0.0],...
xv1_1,yv1_1,[0.0,0.0,0.0],...
xv1_2,yv1_2,[0.0,0.0,0.0],...
xI1_1,yI1_1,[0.0,0.0,0.0],...
xI1_2,yI1_2,[1.0,1.0,1.0],...
xI1_3,yI1_3,[0.0,0.0,0.0],...

```

```

        xI2_1,yI2_1,[0.0,0.0,0.0],...
        xI2_2,yI2_2,[1.0,1.0,1.0],...
        xI2_3,yI2_3,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
xcable10,ycable10,[0.8,0.6,0.2],...
xcable11,ycable11,[0.8,0.6,0.2],...
xcable12,ycable12,[0.8,0.6,0.2],...
xcable13,ycable13,[0.8,0.6,0.2],...
xcable14,ycable14,[0.8,0.6,0.2],...
xcable15,ycable15,[0.8,0.6,0.2],...
        xcurr,ycurr,[0.0,0.0,0.0],...
        'Linestyle','None')

text(-11,11,'Υπολογίζουμε αρχικά τα ισοδύναμα κατά Thevenin κυκλώματα από τα άκρα (a,c) και (b,d)')
text(-7.5,6.5,'R_1','Color',[0.9,0.2,0.0])
text(-5.0,0.7,'R_2','Color',[0.9,0.2,0.0])
text(-1.0,6.5,'R_3','Color',[0.9,0.2,0.0])
text(3.5,6.5,'R_4','Color',[0.9,0.2,0.0])
text(9.5,0.7,'R_5','Color',[0.9,0.2,0.0])
text(-10.5,1.0,'V_1','Color',[0.0,0.2,0.9])
text(0.5,0.0,'I_1','Color',[0.0,0.4,0.4])
text(5.5,0.0,'I_2','Color',[0.0,0.4,0.4])
text(-4.25,5.5,'a','Color',[0.1,0.1,0.1])
text(-4.25,-5.5,'c','Color',[0.1,0.1,0.1])
text(1.25,5.5,'b','Color',[0.1,0.1,0.1])
text(1.25,-5.5,'d','Color',[0.1,0.1,0.1])
text(6.25,5.5,'e','Color',[0.1,0.1,0.1])
text(-2.8,6.0,'I','Color',[0.1,0.1,0.1])

        axis([-12,12,-12,12])
        axis off;
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
        elseif (snmeio==2)
            axes(handles.axes1);
            cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
            x_back=[-12,12,12,-12];
            y_back=[-12,-12,12,12];

            x_tableau=[-11,11,11,-11];
            y_tableau=[-11,-11,9,9];

            x01=-8;
            y01=5;
            th1=0;

            xres_11=x01+[0.40*sin(th1),0.40*sin(th1)+1.2*cos(th1),...
                -0.40*sin(th1)+1.2*cos(th1),-0.40*sin(th1)];
            yres_11=y01+[-0.40*cos(th1),-0.40*cos(th1)+1.2*sin(th1),...
                0.40*cos(th1)+1.2*sin(th1),0.40*cos(th1)];

            xres_12=x01+[-0.05*sin(th1),-0.05*sin(th1)+0.25*cos(th1),...
                -0.40*sin(th1)+0.3*cos(th1),...
                0.25*sin(th1)+0.45*cos(th1),...
                -0.40*sin(th1)+0.6*cos(th1),...
                0.25*sin(th1)+0.75*cos(th1),...
                -0.40*sin(th1)+0.9*cos(th1),...
                -0.05*sin(th1)+0.95*cos(th1),...
                -0.05*sin(th1)+1.2*cos(th1),...
                0.05*sin(th1)+1.2*cos(th1),...
                0.05*sin(th1)+0.95*cos(th1),...
                -0.25*sin(th1)+0.9*cos(th1),...
                0.40*sin(th1)+0.75*cos(th1),...
                -0.25*sin(th1)+0.6*cos(th1),...
                0.40*sin(th1)+0.45*cos(th1),...
                -0.25*sin(th1)+0.3*cos(th1),...
                0.05*sin(th1)+0.25*cos(th1),...
                0.05*sin(th1)];
            yres_12=y01+[0.05*cos(th1),0.05*cos(th1)+0.25*sin(th1),...
                0.40*cos(th1)+0.3*sin(th1),...
                -0.25*cos(th1)+0.45*sin(th1),...

```

```

0.40*cos(th1)+0.6*sin(th1),...
-0.250*cos(th1)+0.75*sin(th1),...
0.40*cos(th1)+0.9*sin(th1),...
0.05*cos(th1)+0.95*sin(th1),...
0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+0.95*sin(th1),...
0.25*cos(th1)+0.9*sin(th1),...
-0.40*cos(th1)+0.75*sin(th1),...
0.25*cos(th1)+0.6*sin(th1),...
-0.40*cos(th1)+0.45*sin(th1),...
0.25*cos(th1)+0.3*sin(th1),...
-0.05*cos(th1)+0.25*sin(th1),...
-0.05*cos(th1)];

x02=-4;
y02=0;
th2=pi/2;

xres_21=x02+[0.25*sin(th2),0.25*sin(th2)+1.6*cos(th2),...
-0.25*sin(th2)+1.6*cos(th2),-0.25*sin(th2)];
yres_21=y02+[-0.25*cos(th2),-0.25*cos(th2)+1.6*sin(th2),...
0.25*cos(th2)+1.6*sin(th2),0.25*cos(th2)];

xres_22=x02+[-0.03*sin(th2),-0.03*sin(th2)+0.33*cos(th2),...
-0.25*sin(th2)+0.4*cos(th2),...
0.10*sin(th2)+0.6*cos(th2),...
-0.25*sin(th2)+0.8*cos(th2),...
0.10*sin(th2)+1.0*cos(th2),...
-0.25*sin(th2)+1.2*cos(th2),...
-0.03*sin(th2)+1.27*cos(th2),...
-0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.27*cos(th2),...
-0.10*sin(th2)+1.2*cos(th2),...
0.25*sin(th2)+1.0*cos(th2),...
-0.10*sin(th2)+0.8*cos(th2),...
0.25*sin(th2)+0.6*cos(th2),...
-0.10*sin(th2)+0.4*cos(th2),...
0.03*sin(th2)+0.33*cos(th2),...
0.03*sin(th2)];
yres_22=y02+[0.03*cos(th2),0.03*cos(th2)+0.33*sin(th2),...
0.25*cos(th2)+0.4*sin(th2),...
-0.10*cos(th2)+0.6*sin(th2),...
0.25*cos(th2)+0.8*sin(th2),...
-0.10*cos(th2)+1.0*sin(th2),...
0.25*cos(th2)+1.2*sin(th2),...
0.03*cos(th2)+1.27*sin(th2),...
0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.27*sin(th2),...
0.10*cos(th2)+1.2*sin(th2),...
-0.25*cos(th2)+1.0*sin(th2),...
0.10*cos(th2)+0.8*sin(th2),...
-0.25*cos(th2)+0.6*sin(th2),...
0.10*cos(th2)+0.4*sin(th2),...
-0.03*cos(th2)+0.33*sin(th2),...
-0.03*cos(th2)];

x06=-9.5;
y06=0;

xv1_1=x06+[-1.0,1.0,1.0,-1.0];
yv1_1=y06+[-0.05,-0.05,0.05,0.05]+0.3;

xv1_2=x06+[-0.4,0.4,0.4,-0.4];
yv1_2=y06+[-0.1,-0.1,0.1,0.1]-0.1;

xcable1=[-9.5,-9.5,-8,-8];
ycable1=y01+[0.1,-0.1,-0.1,0.1];

xcable2=[-9.55,-9.45,-9.45,-9.55];
ycable2=[y01+0.1,y01+0.1,y06+0.4,y06+0.4];

xcable3=[-9.55,-9.45,-9.45,-9.55];
ycable3=[y06-0.2,y06-0.2,-5.0,-5.0];

x03=-1.5;

```

```

        xcable4=[-9.5,-9.5,x03,x03];
        ycable4=-5.0+[0.1,-0.1,-0.1,0.1];

        xcable9=[x03,x03,x01+1.2,x01+1.2];
        ycable9=y01+[0.1,-0.1,-0.1,0.1];

        xcable10=[-3.95,-4.05,-4.05,-3.95];
        ycable10=[y01+0.1,y01+0.1,y02+1.6,y02+1.6];

        xcable11=[-3.95,-4.05,-4.05,-3.95];
        ycable11=[-4.9,-4.9,y02,y02];

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_11,yres_11,[1.0,1.0,1.0],...
xres_12,yres_12,[0.0,0.0,0.0],...
xres_21,yres_21,[1.0,1.0,1.0],...
xres_22,yres_22,[0.0,0.0,0.0],...
xv1_1,yv1_1,[0.0,0.0,0.0],...
xv1_2,yv1_2,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
xcable10,ycable10,[0.8,0.6,0.2],...
xcable11,ycable11,[0.8,0.6,0.2],...
    'LineStyle','None')

text(-11,11,'Υπολογίζουμε αρχικά το ισοδύναμο Thevenin από τα άκρα (a,c). Θα είναι
R_{T1}=R_{1}R_{2}/(R_{1}+R_{2})=')
text(6.2,11.1,nRT1)
text(7.1,11.1,'Ohm')
text(-11,10.0,'και V_{T1}=V_{1}R_{2}/(R_{1}+R_{2})=')
text(-6.2,10.1,nVT1)
text(-5.1,10.1,'Volt')

text(-7.5,6.5,'R_1','Color',[0.9,0.2,0.0])
text(-5.0,0.7,'R_2','Color',[0.9,0.2,0.0])
text(-10.5,1.0,'V_1','Color',[0.0,0.2,0.9])
text(x03,5.5,'a','Color',[0.1,0.1,0.1])
text(x03,-5.5,'c','Color',[0.1,0.1,0.1])

axis([-12,12,-12,12])
axis off;
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

elseif (snmeio==3)
axes(handles.axes1);
cla

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,9,9];

x01=-8;
y01=5;
th1=0;

x02=-4;
y02=0;
th2=pi/2;

x03=-1.5;
y03=5;
th3=0;

x04=3;
y04=5;
th4=0;

xres_41=x04+[0.40*sin(th4),0.40*sin(th4)+1.2*cos(th4),...
-0.40*sin(th4)+1.2*cos(th4),-0.40*sin(th4)];
yres_41=y04+[-0.40*cos(th4),-0.40*cos(th4)+1.2*sin(th4),...

```

```

0.40*cos(th4)+1.2*sin(th4),0.40*cos(th4)];

xres_42=x04+[-0.05*sin(th4),-0.05*sin(th4)+0.25*cos(th4),...
-0.40*sin(th4)+0.3*cos(th4),...
0.25*sin(th4)+0.45*cos(th4),...
-0.40*sin(th4)+0.6*cos(th4),...
0.25*sin(th4)+0.75*cos(th4),...
-0.40*sin(th4)+0.9*cos(th4),...
-0.05*sin(th4)+0.95*cos(th4),...
-0.05*sin(th4)+1.2*cos(th4),...
0.05*sin(th4)+1.2*cos(th4),...
0.05*sin(th4)+0.95*cos(th4),...
-0.25*sin(th4)+0.9*cos(th4),...
0.40*sin(th4)+0.75*cos(th4),...
-0.25*sin(th4)+0.6*cos(th4),...
0.40*sin(th4)+0.45*cos(th4),...
-0.25*sin(th4)+0.3*cos(th4),...
0.05*sin(th4)+0.25*cos(th4),...
0.05*sin(th4)];
yres_42=y04+[0.05*cos(th4),0.05*cos(th4)+0.25*sin(th4),...
0.40*cos(th4)+0.3*sin(th4),...
-0.25*cos(th4)+0.45*sin(th4),...
0.40*cos(th4)+0.6*sin(th4),...
-0.250*cos(th4)+0.75*sin(th4),...
0.40*cos(th4)+0.9*sin(th4),...
0.05*cos(th4)+0.95*sin(th4),...
0.05*cos(th4)+1.2*sin(th4),...
-0.05*cos(th4)+1.2*sin(th4),...
-0.05*cos(th4)+0.95*sin(th4),...
0.25*cos(th4)+0.9*sin(th4),...
-0.40*cos(th4)+0.75*sin(th4),...
0.25*cos(th4)+0.6*sin(th4),...
-0.40*cos(th4)+0.45*sin(th4),...
0.25*cos(th4)+0.3*sin(th4),...
-0.05*cos(th4)+0.25*sin(th4),...
-0.05*cos(th4)];

x05=9;
y05=0;
th5=pi/2;

xres_51=x05+[0.25*sin(th5),0.25*sin(th5)+1.6*cos(th5),...
-0.25*sin(th5)+1.6*cos(th5),-0.25*sin(th5)];
yres_51=y05+[-0.25*cos(th5),-0.25*cos(th5)+1.6*sin(th5),...
0.25*cos(th5)+1.6*sin(th5),0.25*cos(th5)];

xres_52=x05+[-0.03*sin(th5),-0.03*sin(th5)+0.33*cos(th5),...
-0.25*sin(th5)+0.4*cos(th5),...
0.10*sin(th5)+0.6*cos(th5),...
-0.25*sin(th5)+0.8*cos(th5),...
0.10*sin(th5)+1.0*cos(th5),...
-0.25*sin(th5)+1.2*cos(th5),...
-0.03*sin(th5)+1.27*cos(th5),...
-0.03*sin(th5)+1.6*cos(th5),...
0.03*sin(th5)+1.6*cos(th5),...
0.03*sin(th5)+1.27*cos(th5),...
-0.10*sin(th5)+1.2*cos(th5),...
0.25*sin(th5)+1.0*cos(th5),...
-0.10*sin(th5)+0.8*cos(th5),...
0.25*sin(th5)+0.6*cos(th5),...
-0.10*sin(th5)+0.4*cos(th5),...
0.03*sin(th5)+0.33*cos(th5),...
0.03*sin(th5)];
yres_52=y05+[0.03*cos(th5),0.03*cos(th5)+0.33*sin(th5),...
0.25*cos(th5)+0.4*sin(th5),...
-0.10*cos(th5)+0.6*sin(th5),...
0.25*cos(th5)+0.8*sin(th5),...
-0.10*cos(th5)+1.0*sin(th5),...
0.25*cos(th5)+1.2*sin(th5),...
0.03*cos(th5)+1.27*sin(th5),...
0.03*cos(th5)+1.6*sin(th5),...
-0.03*cos(th5)+1.6*sin(th5),...
-0.03*cos(th5)+1.27*sin(th5),...
0.10*cos(th5)+1.2*sin(th5),...
-0.25*cos(th5)+1.0*sin(th5),...
0.10*cos(th5)+0.8*sin(th5),...
-0.25*cos(th5)+0.6*sin(th5),...
0.10*cos(th5)+0.4*sin(th5),...
-0.03*cos(th5)+0.33*sin(th5),...

```

```

-0.03*cos(th5)];
x06=-9.5;
y06=0;

x07=1.5;
y07=0;
phi7=0:0.01:2*pi;

xI1_1=x07+0.6*cos(phi7);
yI1_1=y07+0.9*sin(phi7);

xI1_2=x07+0.55*cos(phi7);
yI1_2=y07+0.85*sin(phi7);

xI1_3=x07+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI1_3=y07+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

x08=6.5;
y08=0;
phi8=0:0.01:2*pi;

xI2_1=x08+0.6*cos(phi8);
yI2_1=y08+0.9*sin(phi8);

xI2_2=x08+0.55*cos(phi8);
yI2_2=y08+0.85*sin(phi8);

xI2_3=x08+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI2_3=y08+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

xcable4=[x03+1.2,x03+1.2,9,9];
ycable4=-5.0+[0.1,-0.1,-0.1,0.1];

xcable5=[8.95,9.05,9.05,8.95];
ycable5=[-4.9,-4.9,0.0,0.0];

xcable6=[8.95,9.05,9.05,8.95];
ycable6=[4.9,4.9,1.6,1.6];

xcable7=[x04+1.2,x04+1.2,9.05,9.05];
ycable7=y01+[0.1,-0.1,-0.1,0.1];

xcable8=[x04,x04,x03+1.2,x03+1.2];
ycable8=y01+[0.1,-0.1,-0.1,0.1];

xcable12=[1.45,1.55,1.55,1.45];
ycable12=[y01+0.1,y01+0.1,y07+0.9,y07+0.9];

xcable13=[1.45,1.55,1.55,1.45];
ycable13=[-4.9,-4.9,y07-0.9,y07-0.9];

xcable14=[1.45,1.55,1.55,1.45]+5.0;
ycable14=[y01+0.1,y01+0.1,y07+0.9,y07+0.9];

xcable15=[1.45,1.55,1.55,1.45]+5.0;
ycable15=[-4.9,-4.9,y07-0.9,y07-0.9];

```

```

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_41,yres_41,[1.0,1.0,1.0],...
xres_42,yres_42,[0.0,0.0,0.0],...
xres_51,yres_51,[1.0,1.0,1.0],...
xres_52,yres_52,[0.0,0.0,0.0],...
xI1_1,yI1_1,[0.0,0.0,0.0],...
xI1_2,yI1_2,[1.0,1.0,1.0],...
xI1_3,yI1_3,[0.0,0.0,0.0],...
xI2_1,yI2_1,[0.0,0.0,0.0],...
xI2_2,yI2_2,[1.0,1.0,1.0],...
xI2_3,yI2_3,[0.0,0.0,0.0],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable12,ycable12,[0.8,0.6,0.2],...
xcable13,ycable13,[0.8,0.6,0.2],...
xcable14,ycable14,[0.8,0.6,0.2],...
xcable15,ycable15,[0.8,0.6,0.2],...
'LineStyle','None')

```

```

text(-11,11,'Υπολογίζουμε μετά το ισοδύναμο κατά Thevenin από τα άκρα (b,d). Ανοίγουμε τις πηγές ρεύματος')
text(-11,10,'και η ισοδύναμη αντίσταση Thevenin θα είναι  $R_{T2}=R_{(4)}+R_{(5)}$ ')
    text(0.0,10.1,nRT2)
    text(0.7,10.1,'Ohm')
    text(3.5,6.5,'R_4','Color',[0.9,0.2,0.0])
    text(9.5,0.7,'R_5','Color',[0.9,0.2,0.0])
    text(0.5,0.0,'I_1','Color',[0.0,0.4,0.4])
    text(5.5,0.0,'I_2','Color',[0.0,0.4,0.4])
    text(x03+1.2,5.5,'b','Color',[0.1,0.1,0.1])
    text(x03+1.2,-5.5,'d','Color',[0.1,0.1,0.1])
    text(6.25,5.5,'e','Color',[0.1,0.1,0.1])

axis([-12,12,-12,12])
axis off;
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

elseif (snmeio==4)
axes(handles.axes1);
cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=-12,12,12,-12];
y_back=-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,8,8];

x01=-8;
y01=5;
th1=0;

x02=-4;
y02=0;
th2=pi/2;

x03=-1.5;
y03=5;
th3=0;

x04=3;
y04=5;
th4=0;

xres_41=x04+[0.40*sin(th4),0.40*sin(th4)+1.2*cos(th4),...
-0.40*sin(th4)+1.2*cos(th4),-0.40*sin(th4)];
yres_41=y04+[-0.40*cos(th4),-0.40*cos(th4)+1.2*sin(th4),...
0.40*cos(th4)+1.2*sin(th4),0.40*cos(th4)];

xres_42=x04+[-0.05*sin(th4),-0.05*sin(th4)+0.25*cos(th4),...
-0.40*sin(th4)+0.3*cos(th4),...
0.25*sin(th4)+0.45*cos(th4),...
-0.40*sin(th4)+0.6*cos(th4),...
0.25*sin(th4)+0.75*cos(th4),...
-0.40*sin(th4)+0.9*cos(th4),...
-0.05*sin(th4)+0.95*cos(th4),...
-0.05*sin(th4)+1.2*cos(th4),...
0.05*sin(th4)+1.2*cos(th4),...
0.05*sin(th4)+0.95*cos(th4),...
-0.25*sin(th4)+0.9*cos(th4),...
0.40*sin(th4)+0.75*cos(th4),...
-0.25*sin(th4)+0.6*cos(th4),...
0.40*sin(th4)+0.45*cos(th4),...
-0.25*sin(th4)+0.3*cos(th4),...
0.05*sin(th4)+0.25*cos(th4),...
0.05*sin(th4)];
yres_42=y04+[0.05*cos(th4),0.05*cos(th4)+0.25*sin(th4),...
0.40*cos(th4)+0.3*sin(th4),...
-0.25*cos(th4)+0.45*sin(th4),...
0.40*cos(th4)+0.6*sin(th4),...
-0.250*cos(th4)+0.75*sin(th4),...
0.40*cos(th4)+0.9*sin(th4),...
0.05*cos(th4)+0.95*sin(th4),...
0.05*cos(th4)+1.2*sin(th4),...
-0.05*cos(th4)+1.2*sin(th4),...
-0.05*cos(th4)+0.95*sin(th4),...
0.25*cos(th4)+0.9*sin(th4),...
-0.40*cos(th4)+0.75*sin(th4),...
0.25*cos(th4)+0.6*sin(th4),...
-0.40*cos(th4)+0.45*sin(th4),...

```



```

0.25*cos(th4)+0.3*sin(th4),...
-0.05*cos(th4)+0.25*sin(th4),...
-0.05*cos(th4)];

x05=9;
y05=0;
th5=pi/2;

xres_51=x05+[0.25*sin(th5),0.25*sin(th5)+1.6*cos(th5),...
-0.25*sin(th5)+1.6*cos(th5),-0.25*sin(th5)];
yres_51=y05+[-0.25*cos(th5),-0.25*cos(th5)+1.6*sin(th5),...
0.25*cos(th5)+1.6*sin(th5),0.25*cos(th5)];

xres_52=x05+[-0.03*sin(th5),-0.03*sin(th5)+0.33*cos(th5),...
-0.25*sin(th5)+0.4*cos(th5),...
0.10*sin(th5)+0.6*cos(th5),...
-0.25*sin(th5)+0.8*cos(th5),...
0.10*sin(th5)+1.0*cos(th5),...
-0.25*sin(th5)+1.2*cos(th5),...
-0.03*sin(th5)+1.27*cos(th5),...
-0.03*sin(th5)+1.6*cos(th5),...
0.03*sin(th5)+1.6*cos(th5),...
0.03*sin(th5)+1.27*cos(th5),...
-0.10*sin(th5)+1.2*cos(th5),...
0.25*sin(th5)+1.0*cos(th5),...
-0.10*sin(th5)+0.8*cos(th5),...
0.25*sin(th5)+0.6*cos(th5),...
-0.10*sin(th5)+0.4*cos(th5),...
0.03*sin(th5)+0.33*cos(th5),...
0.03*sin(th5)];
yres_52=y05+[0.03*cos(th5),0.03*cos(th5)+0.33*sin(th5),...
0.25*cos(th5)+0.4*sin(th5),...
-0.10*cos(th5)+0.6*sin(th5),...
0.25*cos(th5)+0.8*sin(th5),...
-0.10*cos(th5)+1.0*sin(th5),...
0.25*cos(th5)+1.2*sin(th5),...
0.03*cos(th5)+1.27*sin(th5),...
0.03*cos(th5)+1.6*sin(th5),...
-0.03*cos(th5)+1.6*sin(th5),...
-0.03*cos(th5)+1.27*sin(th5),...
0.10*cos(th5)+1.2*sin(th5),...
-0.25*cos(th5)+1.0*sin(th5),...
0.10*cos(th5)+0.8*sin(th5),...
-0.25*cos(th5)+0.6*sin(th5),...
0.10*cos(th5)+0.4*sin(th5),...
-0.03*cos(th5)+0.33*sin(th5),...
-0.03*cos(th5)];
x06=-9.5;
y06=0;

x07=1.5;
y07=0;
phi7=0:0.01:2*pi;

xI1_1=x07+0.6*cos(phi7);
yI1_1=y07+0.9*sin(phi7);

xI1_2=x07+0.55*cos(phi7);
yI1_2=y07+0.85*sin(phi7);

xI1_3=x07+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI1_3=y07+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

x08=6.5;
y08=0;
phi8=0:0.01:2*pi;

xI2_1=x08+0.6*cos(phi8);
yI2_1=y08+0.9*sin(phi8);

xI2_2=x08+0.55*cos(phi8);
yI2_2=y08+0.85*sin(phi8);

xI2_3=x08+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI2_3=y08+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

xcable4=[x03-1.2,x03-1.2,9,9];
ycable4=-5.0+[0.1,-0.1,-0.1,0.1];

```

```

xcable5=[8.95,9.05,9.05,8.95];
ycable5=[-4.9,-4.9,0.0,0.0];

xcable6=[8.95,9.05,9.05,8.95];
ycable6=[4.9,4.9,1.6,1.6];

xcable7=[x04+1.2,x04+1.2,9.05,9.05];
ycable7=y01+[0.1,-0.1,-0.1,0.1];

xcable8=[x04,x04,x03-1.2,x03-1.2];
ycable8=y01+[0.1,-0.1,-0.1,0.1];

xcable12=[1.45,1.55,1.55,1.45];
ycable12=[y01+0.1,y01+0.1,y07+0.9,y07+0.9];

xcable13=[1.45,1.55,1.55,1.45];
ycable13=[-4.9,-4.9,y07-0.9,y07-0.9];

xcable14=[1.45,1.55,1.55,1.45]+5.0;
ycable14=[y01+0.1,y01+0.1,y07+0.9,y07+0.9];

xcable15=[1.45,1.55,1.55,1.45]+5.0;
ycable15=[-4.9,-4.9,y07-0.9,y07-0.9];

xcable16=[x03-1.2,x03-1.3,x03-1.3,x03-1.2];
ycable16=[y01+0.1,y01+0.1,-5.1,-5.1];

xIN2=x03+[-1.2,-1.3,-1.3,-1.5,-1.25,-1.0,-1.2];
yIN2=[0.0,0.0,-2.0,-2.0,-2.5,-2.0,-2.0];

xJ1=6.5+[0.0,0.0,-1.0,-1.0,-1.3,-1.0,-1.0];
yJ1=y01+[-0.1,0.1,0.1,0.3,0.0,-0.3,-0.1];
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_41,yres_41,[1.0,1.0,1.0],...
xres_42,yres_42,[0.0,0.0,0.0],...
xres_51,yres_51,[1.0,1.0,1.0],...
xres_52,yres_52,[0.0,0.0,0.0],...
xi1_1,yi1_1,[0.0,0.0,0.0],...
xi1_2,yi1_2,[1.0,1.0,1.0],...
xi1_3,yi1_3,[0.0,0.0,0.0],...
xi2_1,yi2_1,[0.0,0.0,0.0],...
xi2_2,yi2_2,[1.0,1.0,1.0],...
xi2_3,yi2_3,[0.0,0.0,0.0],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable12,ycable12,[0.8,0.6,0.2],...
xcable13,ycable13,[0.8,0.6,0.2],...
xcable14,ycable14,[0.8,0.6,0.2],...
xcable15,ycable15,[0.8,0.6,0.2],...
xcable16,ycable16,[0.8,0.6,0.2],...
xIN2,yIN2,[0.0,0.0,0.0],...
xJ1,yJ1,[0.0,0.0,0.0],...
'Linestyle','None')

text(-11,11,'Βραχυκυκλώνουμε τα άκρα (b,d) και υπολογίζουμε το ρεύμα βραχυκύκλωσης I_{N2}. Η τάση στον κόμβο b,
λόγω βραχυκύκλωσης')
text(-11,10,'είναι μηδέν οπότε από τον κόμβο e έχουμε (V_{e}/R_{5})+(V_{e}/R_{4})=I_{2}, οπότε V_{e}=')
text(2,10,nVe)
text(2.8,10,'Volt. Το ρεύμα βραχυκύκλωσης είναι!')
text(-11,9,'I_{N2}=I_{1}+J_{1}=I_{1}+(V_{e}/R_{4})=')
text(-6.7,9.1,nIN2)
text(-5.9,9,'A. Άρα η τάση Thevenin θα είναι V_{T2}=I_{N2}R_{T2}=')
text(3,9,nVT2)
text(3.5,9,'Volt')

text(3.5,6.5,'R_{4}','Color',[0.9,0.2,0.0])
text(9.5,0.7,'R_{5}','Color',[0.9,0.2,0.0])
text(0.5,0.0,'I_{1}','Color',[0.0,0.4,0.4])
text(5.5,0.0,'I_{2}','Color',[0.0,0.4,0.4])
text(x03-1.2,5.5,'b','Color',[0.1,0.1,0.1])
text(x03-1.2,-5.5,'d','Color',[0.1,0.1,0.1])
text(6.25,5.5,'e','Color',[0.1,0.1,0.1])
text(x03-2.5,0.0,'I_{N2}','Color',[0.0,0.4,0.4])
text(5.5,5.5,'J_{1}','Color',[0.0,0.4,0.4])

axis([-12,12,-12,12])

```

```

axis off;
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

elseif (snmeio==5)
axes(handles.axes1);
cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,9,9];

x01=-8;
y01=5;
th1=0;

xres_11=x01+[0.40*sin(th1),0.40*sin(th1)+1.2*cos(th1),...
-0.40*sin(th1)+1.2*cos(th1),-0.40*sin(th1)];
yres_11=y01+[-0.40*cos(th1),-0.40*cos(th1)+1.2*sin(th1),...
0.40*cos(th1)+1.2*sin(th1),0.40*cos(th1)];

xres_12=x01+[-0.05*sin(th1),-0.05*sin(th1)+0.25*cos(th1),...
-0.40*sin(th1)+0.3*cos(th1),...
0.25*sin(th1)+0.45*cos(th1),...
-0.40*sin(th1)+0.6*cos(th1),...
0.25*sin(th1)+0.75*cos(th1),...
-0.40*sin(th1)+0.9*cos(th1),...
-0.05*sin(th1)+0.95*cos(th1),...
-0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+0.95*cos(th1),...
-0.25*sin(th1)+0.9*cos(th1),...
0.40*sin(th1)+0.75*cos(th1),...
-0.25*sin(th1)+0.6*cos(th1),...
0.40*sin(th1)+0.45*cos(th1),...
-0.25*sin(th1)+0.3*cos(th1),...
0.05*sin(th1)+0.25*cos(th1),...
0.05*sin(th1)];
yres_12=y01+[0.05*cos(th1),0.05*cos(th1)+0.25*sin(th1),...
0.40*cos(th1)+0.3*sin(th1),...
-0.25*cos(th1)+0.45*sin(th1),...
0.40*cos(th1)+0.6*sin(th1),...
-0.25*cos(th1)+0.75*sin(th1),...
0.40*cos(th1)+0.9*sin(th1),...
0.05*cos(th1)+0.95*sin(th1),...
0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+0.95*sin(th1),...
0.25*cos(th1)+0.9*sin(th1),...
-0.40*cos(th1)+0.75*sin(th1),...
0.25*cos(th1)+0.6*sin(th1),...
-0.40*cos(th1)+0.45*sin(th1),...
0.25*cos(th1)+0.3*sin(th1),...
-0.05*cos(th1)+0.25*sin(th1),...
-0.05*cos(th1)];

x02=-4;
y02=0;
th2=pi/2;

x03=-1.5;
y03=5;
th3=0;

xres_31=x03+[0.40*sin(th3),0.40*sin(th3)+1.2*cos(th3),...
-0.40*sin(th3)+1.2*cos(th3),-0.40*sin(th3)];
yres_31=y03+[-0.40*cos(th3),-0.40*cos(th3)+1.2*sin(th3),...
0.40*cos(th3)+1.2*sin(th3),0.40*cos(th3)];

xres_32=x03+[-0.05*sin(th3),-0.05*sin(th3)+0.25*cos(th3),...
-0.40*sin(th3)+0.3*cos(th3),...
0.25*sin(th3)+0.45*cos(th3),...
-0.40*sin(th3)+0.6*cos(th3),...
0.25*sin(th3)+0.75*cos(th3),...
-0.40*sin(th3)+0.9*cos(th3),...
-0.05*sin(th3)+0.95*cos(th3),...
-0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+1.2*cos(th3),...

```

```

0.05*sin(th3)+0.95*cos(th3),...
-0.25*sin(th3)+0.9*cos(th3),...
0.40*sin(th3)+0.75*cos(th3),...
-0.25*sin(th3)+0.6*cos(th3),...
0.40*sin(th3)+0.45*cos(th3),...
-0.25*sin(th3)+0.3*cos(th3),...
0.05*sin(th3)+0.25*cos(th3),...
0.05*sin(th3)];
yres_32=y03+[0.05*cos(th3),0.05*cos(th3)+0.25*sin(th3),...
0.40*cos(th3)+0.3*sin(th3),...
-0.25*cos(th3)+0.45*sin(th3),...
0.40*cos(th3)+0.6*sin(th3),...
-0.250*cos(th3)+0.75*sin(th3),...
0.40*cos(th3)+0.9*sin(th3),...
0.05*cos(th3)+0.95*sin(th3),...
0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+0.95*sin(th3),...
0.25*cos(th3)+0.9*sin(th3),...
-0.40*cos(th3)+0.75*sin(th3),...
0.25*cos(th3)+0.6*sin(th3),...
-0.40*cos(th3)+0.45*sin(th3),...
0.25*cos(th3)+0.3*sin(th3),...
-0.05*cos(th3)+0.25*sin(th3),...
-0.05*cos(th3)];

x04=3;
y04=5;
th4=0;

xres_41=x04+[0.40*sin(th4),0.40*sin(th4)+1.2*cos(th4),...
-0.40*sin(th4)+1.2*cos(th4),-0.40*sin(th4)];
yres_41=y04+[-0.40*cos(th4),-0.40*cos(th4)+1.2*sin(th4),...
0.40*cos(th4)+1.2*sin(th4),0.40*cos(th4)];

xres_42=x04+[-0.05*sin(th4),-0.05*sin(th4)+0.25*cos(th4),...
-0.40*sin(th4)+0.3*cos(th4),...
0.25*sin(th4)+0.45*cos(th4),...
-0.40*sin(th4)+0.6*cos(th4),...
0.25*sin(th4)+0.75*cos(th4),...
-0.40*sin(th4)+0.9*cos(th4),...
-0.05*sin(th4)+0.95*cos(th4),...
-0.05*sin(th4)+1.2*cos(th4),...
0.05*sin(th4)+1.2*cos(th4),...
0.05*sin(th4)+0.95*cos(th4),...
-0.25*sin(th4)+0.9*cos(th4),...
0.40*sin(th4)+0.75*cos(th4),...
-0.25*sin(th4)+0.6*cos(th4),...
0.40*sin(th4)+0.45*cos(th4),...
-0.25*sin(th4)+0.3*cos(th4),...
0.05*sin(th4)+0.25*cos(th4),...
0.05*sin(th4)];
yres_42=y04+[0.05*cos(th4),0.05*cos(th4)+0.25*sin(th4),...
0.40*cos(th4)+0.3*sin(th4),...
-0.25*cos(th4)+0.45*sin(th4),...
0.40*cos(th4)+0.6*sin(th4),...
-0.250*cos(th4)+0.75*sin(th4),...
0.40*cos(th4)+0.9*sin(th4),...
0.05*cos(th4)+0.95*sin(th4),...
0.05*cos(th4)+1.2*sin(th4),...
-0.05*cos(th4)+1.2*sin(th4),...
-0.05*cos(th4)+0.95*sin(th4),...
0.25*cos(th4)+0.9*sin(th4),...
-0.40*cos(th4)+0.75*sin(th4),...
0.25*cos(th4)+0.6*sin(th4),...
-0.40*cos(th4)+0.45*sin(th4),...
0.25*cos(th4)+0.3*sin(th4),...
-0.05*cos(th4)+0.25*sin(th4),...
-0.05*cos(th4)];

x05=9;
y05=0;
th5=pi/2;

x06=-9.5;
y06=0;

xv1_1=x06+[-1.0,1.0,1.0,-1.0];

```

```

yV1_1=y06+[-0.05,-0.05,0.05,0.05]+0.3;

xV1_2=x06+[-0.4,0.4,0.4,-0.4];
yV1_2=y06+[-0.1,-0.1,0.1,0.1]-0.1;

x07=1.5;
y07=0;
phi7=0:0.01:2*pi;

x08=6.5;
y08=0;
phi8=0:0.01:2*pi;

x09=9.0;
y09=0.2;

xV2_1=x09+[-1.0,1.0,1.0,-1.0];
yV2_1=y09+[-0.05,-0.05,0.05,0.05]+0.3;

xV2_2=x09+[-0.4,0.4,0.4,-0.4];
yV2_2=y09+[-0.1,-0.1,0.1,0.1]-0.1;

xcable1=[-9.5,-9.5,-8,-8];
ycable1=y01+[0.1,-0.1,-0.1,0.1];

xcable2=[-9.55,-9.45,-9.45,-9.55];
ycable2=[y01+0.1,y01+0.1,y06+0.4,y06+0.4];

xcable3=[-9.55,-9.45,-9.45,-9.55];
ycable3=[y06-0.2,y06-0.2,-5.0,-5.0];

xcable4=[-9.5,-9.5,9,9];
ycable4=-5.0+[0.1,-0.1,-0.1,0.1];

xcable5=[8.95,9.05,9.05,8.95];
ycable5=[-4.9,-4.9,0.0,0.0];

xcable6=[8.95,9.05,9.05,8.95];
ycable6=[4.9,4.9,0.6,0.6];

xcable7=[x04+1.2,x04+1.2,9.05,9.05];
ycable7=y01+[0.1,-0.1,-0.1,0.1];

xcable8=[x04,x04,x03+1.2,x03+1.2];
ycable8=y01+[0.1,-0.1,-0.1,0.1];

xcable9=[x03,x03,x01+1.2,x01+1.2];
ycable9=y01+[0.1,-0.1,-0.1,0.1];

xcurr=1.0+[-3.95,-3.45,-3.45,-3.25,-3.45,-3.45,-3.95];
ycurr=y01+[0.1,0.1,0.3,0.0,-0.3,-0.1,-0.1];

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_11,yres_11,[1.0,1.0,1.0],...
xres_12,yres_12,[0.0,0.0,0.0],...
xres_31,yres_31,[1.0,1.0,1.0],...
xres_32,yres_32,[0.0,0.0,0.0],...
xres_41,yres_41,[1.0,1.0,1.0],...
xres_42,yres_42,[0.0,0.0,0.0],...
xV1_1,yV1_1,[0.0,0.0,0.0],...
xV1_2,yV1_2,[0.0,0.0,0.0],...
xV2_1,yV2_1,[0.0,0.0,0.0],...
xV2_2,yV2_2,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
xcurr,ycurr,[0.0,0.0,0.0],...
'LineStyle','None')

text(-11,11,'Προκύπτει συνέπας το παρακάτω ισοδύναμο του αρχικού κυκλώματος. Θα έχουμε')
text(-11,10,'V_{T1}-IR_{T1}-IR_{T3}-IR_{T2}-V_{T2}=0, οπότε I=')
text(-4.8,10.1,nI)

```

```

        text(-3.8,10.1,'A.')
text(-7.5,6.5,'R_{T1}','Color',[0.9,0.2,0.0])
text(-1.0,6.5,'R_3','Color',[0.9,0.2,0.0])
text(3.5,6.5,'R_{T2}','Color',[0.9,0.2,0.0])
text(-10.5,1.0,'V_{T1}','Color',[0.0,0.2,0.9])
text(9.5,1.0,'V_{T2}','Color',[0.0,0.2,0.9])
text(-4.25,5.5,'a','Color',[0.1,0.1,0.1])
text(-4.25,-5.5,'c','Color',[0.1,0.1,0.1])
text(1.25,5.5,'b','Color',[0.1,0.1,0.1])
text(1.25,-5.5,'d','Color',[0.1,0.1,0.1])
text(-2.8,6.0,'I','Color',[0.1,0.1,0.1])

axis([-12,12,-12,12])
axis off;
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

else
end

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

% --- Executes on button press in pushbutton4.
function pushbutton4_Callback(hObject, eventdata, handles)
% hObject handle to pushbutton4 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)
hfin=questdlg('Εξοδος από το πρόγραμμα?');
switch hfin
case 'Yes'
closereq;
end

```

Άσκηση 3

```

function varargout = g_asknsn_3(varargin)
% G_ASKNSN_3 M-file for g_asknsn_3.fig
% G_ASKNSN_3, by itself, creates a new G_ASKNSN_3 or raises the existing
% singleton*.
%
% H = G_ASKNSN_3 returns the handle to a new G_ASKNSN_3 or the handle to
% the existing singleton*.
%
% G_ASKNSN_3('CALLBACK',hObject,eventData,handles,...) calls the local
% function named CALLBACK in G_ASKNSN_3.M with the given input arguments.
%
% G_ASKNSN_3('Property','Value',...) creates a new G_ASKNSN_3 or raises the
% existing singleton*. Starting from the left, property value pairs are
% applied to the GUI before g_asknsn_3_OpeningFcn gets called. An
% unrecognized property name or invalid value makes property application
% stop. All inputs are passed to g_asknsn_3_OpeningFcn via varargin.
%
% *See GUI Options on GUIDE's Tools menu. Choose "GUI allows only one
% instance to run (singleton)".
%
% See also: GUIDE, GUIDATA, GUIHANDLES

% Edit the above text to modify the response to help g_asknsn_3

% Last Modified by GUIDE v2.5 12-Dec-2013 03:10:24

% Begin initialization code - DO NOT EDIT
gui_Singleton = 1;
gui_State = struct('gui_Name', mfilename, ...
'gui_Singleton', gui_Singleton, ...
'gui_OpeningFcn', @g_asknsn_3_OpeningFcn, ...
'gui_OutputFcn', @g_asknsn_3_OutputFcn, ...
'gui_LayoutFcn', [], ...
'gui_Callback', []);
if nargin && ischar(varargin{1})
gui_State.gui_Callback = str2func(varargin{1});
end

```

```

        if nargin
[varargout{1:nargout}] = gui_mainfcn(gui_State, varargin{:});
        else
            gui_mainfcn(gui_State, varargin{:});
        end
    % End initialization code - DO NOT EDIT

    % --- Executes just before g_asknsn_3 is made visible.
function g_asknsn_3_OpeningFcn(hObject, eventdata, handles, varargin)
    % This function has no output args, see OutputFcn.
    % hObject    handle to figure
    % eventdata reserved - to be defined in a future version of MATLAB
    % handles    structure with handles and user data (see GUIDATA)
    % varargin   command line arguments to g_asknsn_3 (see VARARGIN)

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
        x_back=[-12,12,12,-12];
        y_back=[-12,-12,12,12];

        x_tableau=[-11,11,11,-11];
        y_tableau=[-11,-11,9,9];

        x01=-9.5;
        y01=0;
        th1=pi/2;

        xres_11=x01+[0.25*sin(th1),0.25*sin(th1)+1.6*cos(th1),...
        -0.25*sin(th1)+1.6*cos(th1),-0.25*sin(th1)];
        yres_11=y01+[-0.25*cos(th1),-0.25*cos(th1)+1.6*sin(th1),...
        0.25*cos(th1)+1.6*sin(th1),0.25*cos(th1)];

        xres_12=x01+[-0.03*sin(th1),-0.03*sin(th1)+0.33*cos(th1),...
        -0.25*sin(th1)+0.4*cos(th1),...
        0.10*sin(th1)+0.6*cos(th1),...
        -0.25*sin(th1)+0.8*cos(th1),...
        0.10*sin(th1)+1.0*cos(th1),...
        -0.25*sin(th1)+1.2*cos(th1),...
        -0.03*sin(th1)+1.27*cos(th1),...
        -0.03*sin(th1)+1.6*cos(th1),...
        0.03*sin(th1)+1.6*cos(th1),...
        0.03*sin(th1)+1.27*cos(th1),...
        -0.10*sin(th1)+1.2*cos(th1),...
        0.25*sin(th1)+1.0*cos(th1),...
        -0.10*sin(th1)+0.8*cos(th1),...
        0.25*sin(th1)+0.6*cos(th1),...
        -0.10*sin(th1)+0.4*cos(th1),...
        0.03*sin(th1)+0.33*cos(th1),...
        0.03*sin(th1)];
        yres_12=y01+[0.03*cos(th1),0.03*cos(th1)+0.33*sin(th1),...
        0.25*cos(th1)+0.4*sin(th1),...
        -0.10*cos(th1)+0.6*sin(th1),...
        0.25*cos(th1)+0.8*sin(th1),...
        -0.10*cos(th1)+1.0*sin(th1),...
        0.25*cos(th1)+1.2*sin(th1),...
        0.03*cos(th1)+1.27*sin(th1),...
        0.03*cos(th1)+1.6*sin(th1),...
        -0.03*cos(th1)+1.6*sin(th1),...
        -0.03*cos(th1)+1.27*sin(th1),...
        0.10*cos(th1)+1.2*sin(th1),...
        -0.25*cos(th1)+1.0*sin(th1),...
        0.10*cos(th1)+0.8*sin(th1),...
        -0.25*cos(th1)+0.6*sin(th1),...
        0.10*cos(th1)+0.4*sin(th1),...
        -0.03*cos(th1)+0.33*sin(th1),...
        -0.03*cos(th1)];

        x02=-4;
        y02=0;
        th2=pi/2;

        xres_21=x02+[0.25*sin(th2),0.25*sin(th2)+1.6*cos(th2),...
        -0.25*sin(th2)+1.6*cos(th2),-0.25*sin(th2)];
        yres_21=y02+[-0.25*cos(th2),-0.25*cos(th2)+1.6*sin(th2),...
        0.25*cos(th2)+1.6*sin(th2),0.25*cos(th2)];

        xres_22=x02+[-0.03*sin(th2),-0.03*sin(th2)+0.33*cos(th2),...
        -0.25*sin(th2)+0.4*cos(th2),...

```

```

0.10*sin(th2)+0.6*cos(th2),...
-0.25*sin(th2)+0.8*cos(th2),...
0.10*sin(th2)+1.0*cos(th2),...
-0.25*sin(th2)+1.2*cos(th2),...
-0.03*sin(th2)+1.27*cos(th2),...
-0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.27*cos(th2),...
-0.10*sin(th2)+1.2*cos(th2),...
0.25*sin(th2)+1.0*cos(th2),...
-0.10*sin(th2)+0.8*cos(th2),...
0.25*sin(th2)+0.6*cos(th2),...
-0.10*sin(th2)+0.4*cos(th2),...
0.03*sin(th2)+0.33*cos(th2),...
0.03*sin(th2)];
yres_22=y02+[0.03*cos(th2),0.03*cos(th2)+0.33*sin(th2),...
0.25*cos(th2)+0.4*sin(th2),...
-0.10*cos(th2)+0.6*sin(th2),...
0.25*cos(th2)+0.8*sin(th2),...
-0.10*cos(th2)+1.0*sin(th2),...
0.25*cos(th2)+1.2*sin(th2),...
0.03*cos(th2)+1.27*sin(th2),...
0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.27*sin(th2),...
0.10*cos(th2)+1.2*sin(th2),...
-0.25*cos(th2)+1.0*sin(th2),...
0.10*cos(th2)+0.8*sin(th2),...
-0.25*cos(th2)+0.6*sin(th2),...
0.10*cos(th2)+0.4*sin(th2),...
-0.03*cos(th2)+0.33*sin(th2),...
-0.03*cos(th2)];

x03=3;
y03=5;
th3=0;

xres_31=x03+[0.40*sin(th3),0.40*sin(th3)+1.2*cos(th3),...
-0.40*sin(th3)+1.2*cos(th3),-0.40*sin(th3)];
yres_31=y03+[-0.40*cos(th3),-0.40*cos(th3)+1.2*sin(th3),...
0.40*cos(th3)+1.2*sin(th3),0.40*cos(th3)];

xres_32=x03+[-0.05*sin(th3),-0.05*sin(th3)+0.25*cos(th3),...
-0.40*sin(th3)+0.3*cos(th3),...
0.25*sin(th3)+0.45*cos(th3),...
-0.40*sin(th3)+0.6*cos(th3),...
0.25*sin(th3)+0.75*cos(th3),...
-0.40*sin(th3)+0.9*cos(th3),...
-0.05*sin(th3)+0.95*cos(th3),...
-0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+0.95*cos(th3),...
-0.25*sin(th3)+0.9*cos(th3),...
0.40*sin(th3)+0.75*cos(th3),...
-0.25*sin(th3)+0.6*cos(th3),...
0.40*sin(th3)+0.45*cos(th3),...
-0.25*sin(th3)+0.3*cos(th3),...
0.05*sin(th3)+0.25*cos(th3),...
0.05*sin(th3)];
yres_32=y03+[0.05*cos(th3),0.05*cos(th3)+0.25*sin(th3),...
0.40*cos(th3)+0.3*sin(th3),...
-0.25*cos(th3)+0.45*sin(th3),...
0.40*cos(th3)+0.6*sin(th3),...
-0.250*cos(th3)+0.75*sin(th3),...
0.40*cos(th3)+0.9*sin(th3),...
0.05*cos(th3)+0.95*sin(th3),...
0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+0.95*sin(th3),...
0.25*cos(th3)+0.9*sin(th3),...
-0.40*cos(th3)+0.75*sin(th3),...
0.25*cos(th3)+0.6*sin(th3),...
-0.40*cos(th3)+0.45*sin(th3),...
0.25*cos(th3)+0.3*sin(th3),...
-0.05*cos(th3)+0.25*sin(th3),...
-0.05*cos(th3)];

x04=-9.5;
y04=-3;

xv1_1=x04+[-1.0,1.0,1.0,-1.0];

```



```

yV1_1=y04+[-0.05,-0.05,0.05,0.05]+0.3;
    xV1_2=x04+[-0.4,0.4,0.4,-0.4];
    yV1_2=y04+[-0.1,-0.1,0.1,0.1]-0.1;

    x05=-4;
    y05=-3;

    xV2_1=x05+[-1.0,1.0,1.0,-1.0];
    yV2_1=y05+[-0.05,-0.05,0.05,0.05]+0.3;

    xV2_2=x05+[-0.4,0.4,0.4,-0.4];
    yV2_2=y05+[-0.1,-0.1,0.1,0.1]-0.1;

    x06=0;
    y06=5;

xV3_1=x06+[-0.032,0.032,0.032,-0.032]+0.1;
    yV3_1=y06+[-1.5,-1.5,1.5,1.5];

xV3_2=x06+[-0.05,0.05,0.05,-0.05]-0.2;
    yV3_2=y06+[-0.75,-0.75,0.75,0.75];

xcable1=[-9.5,-9.5,x06-0.25,x06-0.25];
    ycable1=y06+[0.1,-0.1,-0.1,0.1];

    xcable2=[-9.55,-9.45,-9.45,-9.55];
    ycable2=[y01+1.6,y01+1.6,y06,y06];

    xcable3=[-9.55,-9.45,-9.45,-9.55];
    ycable3=[y01,y01,y04+0.35,y04+0.35];

    xcable4=[-9.55,-9.45,-9.45,-9.55];
    ycable4=[-7.0,-7.0,y04-0.2,y04-0.2];

    xcable5=[-9.5,-9.5,9,9];
    ycable5=-7.0+[0.1,-0.1,-0.1,0.1];

xcable6=[-9.55,-9.45,-9.45,-9.55]+5.5;
    ycable6=[y01+1.6,y01+1.6,y06,y06];

xcable7=[-9.55,-9.45,-9.45,-9.55]+5.5;
    ycable7=[y01,y01,y04+0.35,y04+0.35];

xcable8=[-9.55,-9.45,-9.45,-9.55]+5.5;
    ycable8=[-7.0,-7.0,y04-0.2,y04-0.2];

xcable9=[x03,x03,x06+0.132,x06+0.132];
    ycable9=y06+[0.1,-0.1,-0.1,0.1];

    xcable10=[x03+1.2,x03+1.2,9,9];
    ycable10=y06+[0.1,-0.1,-0.1,0.1];

xI_1=-9.5+[-0.05,0.05,0.05,0.25,0.0,-0.25,-0.05];
    yI_1=2.5+[0.0,0.0,1.5,1.5,2.0,1.5,1.5];

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_11,yres_11,[1.0,1.0,1.0],...
xres_12,yres_12,[0.0,0.0,0.0],...
xres_21,yres_21,[1.0,1.0,1.0],...
xres_22,yres_22,[0.0,0.0,0.0],...
xres_31,yres_31,[1.0,1.0,1.0],...
xres_32,yres_32,[0.0,0.0,0.0],...
xV1_1,yV1_1,[0.0,0.0,0.0],...
xV1_2,yV1_2,[0.0,0.0,0.0],...
xV2_1,yV2_1,[0.0,0.0,0.0],...
xV2_2,yV2_2,[0.0,0.0,0.0],...
xV3_1,yV3_1,[0.0,0.0,0.0],...
xV3_2,yV3_2,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...

```

```

        xcable8,ycable8,[0.8,0.6,0.2],...
        xcable9,ycable9,[0.8,0.6,0.2],...
        xcable10,ycable10,[0.8,0.6,0.2],...
        xI_1,yI_1,[0.0,0.0,0.0],...
        'LineStyle','None')

text(-11,11,'Να υπολογιστεί το ισοδύναμο Thevenin του παρακάτω κυκλώματος απο τα άκρα A, B')
text(-10.5,0.7,'R_1','Color',[0.9,0.2,0.0])
text(-5.0,0.7,'R_2','Color',[0.9,0.2,0.0])
text(3.5,6.5,'R_3','Color',[0.9,0.2,0.0])
text(-10.5,-2.0,'V_1','Color',[0.0,0.2,0.9])
text(-5.0,-2.0,'aV_1','Color',[0.0,0.2,0.9])
text(-10.5,3.5,'I_1','Color',[0.7,0.0,0.7])
text(-0.5,6.5,'bI_1','Color',[0.0,0.2,0.9])
text(9.5,y06,'A','Color',[0.9,0.0,0.0])
text(9.5,-7.0,'B','Color',[0.9,0.0,0.0])

axis([-12,12,-12,12])
axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

% Choose default command line output for g_asknsn_3
handles.output = hObject;

% Update handles structure
guidata(hObject, handles);

% UIWAIT makes g_asknsn_3 wait for user response (see UIRESUME)
% uiwait(handles.figure1);

% --- Outputs from this function are returned to the command line.
function varargout = g_asknsn_3_OutputFcn(hObject, eventdata, handles)
% varargout cell array for returning output args (see VARARGOUT);
% hObject handle to figure
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

% Get default command line output from handles structure
varargout{1} = handles.output;

function edit1_Callback(hObject, eventdata, handles)
% hObject handle to edit1 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit1 as text
% str2double(get(hObject,'String')) returns contents of edit1 as a double

% --- Executes during object creation, after setting all properties.
function edit1_CreateFcn(hObject, eventdata, handles)
% hObject handle to edit1 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles empty - handles not created until after all CreateFcns called

% Hint: edit controls usually have a white background on Windows.
% See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
set(hObject,'BackgroundColor','white');
end

function edit2_Callback(hObject, eventdata, handles)
% hObject handle to edit2 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit2 as text
% str2double(get(hObject,'String')) returns contents of edit2 as a double

% --- Executes during object creation, after setting all properties.
function edit2_CreateFcn(hObject, eventdata, handles)
% hObject handle to edit2 (see GCBO)

```

```

    % eventdata reserved - to be defined in a future version of MATLAB
    % handles empty - handles not created until after all CreateFcns called

    % Hint: edit controls usually have a white background on Windows.
    % See ISPC and COMPUTER.
    if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUiControlBackgroundColor'))
        set(hObject,'BackgroundColor','white');
    end

    function edit3_Callback(hObject, eventdata, handles)
        % hObject handle to edit3 (see GCBO)
        % eventdata reserved - to be defined in a future version of MATLAB
        % handles structure with handles and user data (see GUIDATA)

        % Hints: get(hObject,'String') returns contents of edit3 as text
        % str2double(get(hObject,'String')) returns contents of edit3 as a double

        % --- Executes during object creation, after setting all properties.
        function edit3_CreateFcn(hObject, eventdata, handles)
            % hObject handle to edit3 (see GCBO)
            % eventdata reserved - to be defined in a future version of MATLAB
            % handles empty - handles not created until after all CreateFcns called

            % Hint: edit controls usually have a white background on Windows.
            % See ISPC and COMPUTER.
            if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUiControlBackgroundColor'))
                set(hObject,'BackgroundColor','white');
            end

            function edit4_Callback(hObject, eventdata, handles)
                % hObject handle to edit4 (see GCBO)
                % eventdata reserved - to be defined in a future version of MATLAB
                % handles structure with handles and user data (see GUIDATA)

                % Hints: get(hObject,'String') returns contents of edit4 as text
                % str2double(get(hObject,'String')) returns contents of edit4 as a double

                % --- Executes during object creation, after setting all properties.
                function edit4_CreateFcn(hObject, eventdata, handles)
                    % hObject handle to edit4 (see GCBO)
                    % eventdata reserved - to be defined in a future version of MATLAB
                    % handles empty - handles not created until after all CreateFcns called

                    % Hint: edit controls usually have a white background on Windows.
                    % See ISPC and COMPUTER.
                    if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUiControlBackgroundColor'))
                        set(hObject,'BackgroundColor','white');
                    end

                    function edit5_Callback(hObject, eventdata, handles)
                        % hObject handle to edit5 (see GCBO)
                        % eventdata reserved - to be defined in a future version of MATLAB
                        % handles structure with handles and user data (see GUIDATA)

                        % Hints: get(hObject,'String') returns contents of edit5 as text
                        % str2double(get(hObject,'String')) returns contents of edit5 as a double

                        % --- Executes during object creation, after setting all properties.
                        function edit5_CreateFcn(hObject, eventdata, handles)
                            % hObject handle to edit5 (see GCBO)
                            % eventdata reserved - to be defined in a future version of MATLAB
                            % handles empty - handles not created until after all CreateFcns called

                            % Hint: edit controls usually have a white background on Windows.
                            % See ISPC and COMPUTER.
                            if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUiControlBackgroundColor'))
                                set(hObject,'BackgroundColor','white');
                            end

                            function edit6_Callback(hObject, eventdata, handles)

```

```

        % hObject    handle to edit6 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit6 as text
% str2double(get(hObject,'String')) returns contents of edit6 as a double

% --- Executes during object creation, after setting all properties.
function edit6_CreateFcn(hObject, eventdata, handles)
    % hObject    handle to edit6 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFns called

% Hint: edit controls usually have a white background on Windows.
%         See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

% --- Executes on button press in pushbutton1.
function pushbutton1_Callback(hObject, eventdata, handles)
    % hObject    handle to pushbutton1 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
global R1;
global R2;
global R3;
global V1;
global a;
global b;

R1=str2double(get(handles.edit1,'String'));
R2=str2double(get(handles.edit2,'String'));
R3=str2double(get(handles.edit3,'String'));
V1=str2double(get(handles.edit4,'String'));
a=str2double(get(handles.edit5,'String'));
b=str2double(get(handles.edit6,'String'));

if (R1>10|R1<1)
h=warndlg('Βάλτε στην αντίσταση R1 τιμή μεταξύ 1 και 10');
return
end

if (R2>10|R2<1)
h=warndlg('Βάλτε στην αντίσταση R2 τιμή μεταξύ 1 και 10');
return
end

if (R3>10|R3<1)
h=warndlg('Βάλτε στην αντίσταση R3 τιμή μεταξύ 1 και 10');
return
end

if (V1>15|V1<5)
h=warndlg('Βάλτε στην τάση V1 τιμή μεταξύ 5 και 15');
return
end

if (a>1.0|a<0.1)
h=warndlg('Βάλτε στην σταθερά a τιμή μεταξύ 0.1 και 1.0');
return
end

if (b>1.0|b<0.1)
h=warndlg('Βάλτε στην σταθερά b τιμή μεταξύ 0.1 και 1.0');
return
end

axes(handles.axes1)
axis off;
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
global snmeio;

snmeio=1;
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

```

```

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,9,9];

x01=-9.5;
y01=0;
th1=pi/2;

xres_11=x01+[0.25*sin(th1),0.25*sin(th1)+1.6*cos(th1),...
-0.25*sin(th1)+1.6*cos(th1),-0.25*sin(th1)];
yres_11=y01+[-0.25*cos(th1),-0.25*cos(th1)+1.6*sin(th1),...
0.25*cos(th1)+1.6*sin(th1),0.25*cos(th1)];

xres_12=x01+[-0.03*sin(th1),-0.03*sin(th1)+0.33*cos(th1),...
-0.25*sin(th1)+0.4*cos(th1),...
0.10*sin(th1)+0.6*cos(th1),...
-0.25*sin(th1)+0.8*cos(th1),...
0.10*sin(th1)+1.0*cos(th1),...
-0.25*sin(th1)+1.2*cos(th1),...
-0.03*sin(th1)+1.27*cos(th1),...
-0.03*sin(th1)+1.6*cos(th1),...
0.03*sin(th1)+1.6*cos(th1),...
0.03*sin(th1)+1.27*cos(th1),...
-0.10*sin(th1)+1.2*cos(th1),...
0.25*sin(th1)+1.0*cos(th1),...
-0.10*sin(th1)+0.8*cos(th1),...
0.25*sin(th1)+0.6*cos(th1),...
-0.10*sin(th1)+0.4*cos(th1),...
0.03*sin(th1)+0.33*cos(th1),...
0.03*sin(th1)];
yres_12=y01+[0.03*cos(th1),0.03*cos(th1)+0.33*sin(th1),...
0.25*cos(th1)+0.4*sin(th1),...
-0.10*cos(th1)+0.6*sin(th1),...
0.25*cos(th1)+0.8*sin(th1),...
-0.10*cos(th1)+1.0*sin(th1),...
0.25*cos(th1)+1.2*sin(th1),...
0.03*cos(th1)+1.27*sin(th1),...
0.03*cos(th1)+1.6*sin(th1),...
-0.03*cos(th1)+1.6*sin(th1),...
-0.03*cos(th1)+1.27*sin(th1),...
0.10*cos(th1)+1.2*sin(th1),...
-0.25*cos(th1)+1.0*sin(th1),...
0.10*cos(th1)+0.8*sin(th1),...
-0.25*cos(th1)+0.6*sin(th1),...
0.10*cos(th1)+0.4*sin(th1),...
-0.03*cos(th1)+0.33*sin(th1),...
-0.03*cos(th1)];

x02=-4;
y02=0;
th2=pi/2;

xres_21=x02+[0.25*sin(th2),0.25*sin(th2)+1.6*cos(th2),...
-0.25*sin(th2)+1.6*cos(th2),-0.25*sin(th2)];
yres_21=y02+[-0.25*cos(th2),-0.25*cos(th2)+1.6*sin(th2),...
0.25*cos(th2)+1.6*sin(th2),0.25*cos(th2)];

xres_22=x02+[-0.03*sin(th2),-0.03*sin(th2)+0.33*cos(th2),...
-0.25*sin(th2)+0.4*cos(th2),...
0.10*sin(th2)+0.6*cos(th2),...
-0.25*sin(th2)+0.8*cos(th2),...
0.10*sin(th2)+1.0*cos(th2),...
-0.25*sin(th2)+1.2*cos(th2),...
-0.03*sin(th2)+1.27*cos(th2),...
-0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.27*cos(th2),...
-0.10*sin(th2)+1.2*cos(th2),...
0.25*sin(th2)+1.0*cos(th2),...
-0.10*sin(th2)+0.8*cos(th2),...
0.25*sin(th2)+0.6*cos(th2),...
-0.10*sin(th2)+0.4*cos(th2),...
0.03*sin(th2)+0.33*cos(th2),...
0.03*sin(th2)];
yres_22=y02+[0.03*cos(th2),0.03*cos(th2)+0.33*sin(th2),...
0.25*cos(th2)+0.4*sin(th2),...
-0.10*cos(th2)+0.6*sin(th2),...
0.25*cos(th2)+0.8*sin(th2),...
-0.10*cos(th2)+1.0*sin(th2),...

```

```

0.25*cos(th2)+1.2*sin(th2),...
0.03*cos(th2)+1.27*sin(th2),...
0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.27*sin(th2),...
0.10*cos(th2)+1.2*sin(th2),...
-0.25*cos(th2)+1.0*sin(th2),...
0.10*cos(th2)+0.8*sin(th2),...
-0.25*cos(th2)+0.6*sin(th2),...
0.10*cos(th2)+0.4*sin(th2),...
-0.03*cos(th2)+0.33*sin(th2),...
-0.03*cos(th2)];

x03=3;
y03=5;
th3=0;

xres_31=x03+[0.40*sin(th3),0.40*sin(th3)+1.2*cos(th3),...
-0.40*sin(th3)+1.2*cos(th3),-0.40*sin(th3)];
yres_31=y03+[-0.40*cos(th3),-0.40*cos(th3)+1.2*sin(th3),...
0.40*cos(th3)+1.2*sin(th3),0.40*cos(th3)];

xres_32=x03+[-0.05*sin(th3),-0.05*sin(th3)+0.25*cos(th3),...
-0.40*sin(th3)+0.3*cos(th3),...
0.25*sin(th3)+0.45*cos(th3),...
-0.40*sin(th3)+0.6*cos(th3),...
0.25*sin(th3)+0.75*cos(th3),...
-0.40*sin(th3)+0.9*cos(th3),...
-0.05*sin(th3)+0.95*cos(th3),...
-0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+0.95*cos(th3),...
-0.25*sin(th3)+0.9*cos(th3),...
0.40*sin(th3)+0.75*cos(th3),...
-0.25*sin(th3)+0.6*cos(th3),...
0.40*sin(th3)+0.45*cos(th3),...
-0.25*sin(th3)+0.3*cos(th3),...
0.05*sin(th3)+0.25*cos(th3),...
0.05*sin(th3)];
yres_32=y03+[0.05*cos(th3),0.05*cos(th3)+0.25*sin(th3),...
0.40*cos(th3)+0.3*sin(th3),...
-0.25*cos(th3)+0.45*sin(th3),...
0.40*cos(th3)+0.6*sin(th3),...
-0.250*cos(th3)+0.75*sin(th3),...
0.40*cos(th3)+0.9*sin(th3),...
0.05*cos(th3)+0.95*sin(th3),...
0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+0.95*sin(th3),...
0.25*cos(th3)+0.9*sin(th3),...
-0.40*cos(th3)+0.75*sin(th3),...
0.25*cos(th3)+0.6*sin(th3),...
-0.40*cos(th3)+0.45*sin(th3),...
0.25*cos(th3)+0.3*sin(th3),...
-0.05*cos(th3)+0.25*sin(th3),...
-0.05*cos(th3)];

x04=-9.5;
y04=-3;

xv1_1=x04+[-1.0,1.0,1.0,-1.0];
yv1_1=y04+[-0.05,-0.05,0.05,0.05]+0.3;

xv1_2=x04+[-0.4,0.4,0.4,-0.4];
yv1_2=y04+[-0.1,-0.1,0.1,0.1]-0.1;

x05=-4;
y05=-3;

xv2_1=x05+[-1.0,1.0,1.0,-1.0];
yv2_1=y05+[-0.05,-0.05,0.05,0.05]+0.3;

xv2_2=x05+[-0.4,0.4,0.4,-0.4];
yv2_2=y05+[-0.1,-0.1,0.1,0.1]-0.1;

x06=0;
y06=5;

xv3_1=x06+[-0.032,0.032,0.032,-0.032]+0.1;

```

```

yV3_1=y06+[-1.5,-1.5,1.5,1.5];
xV3_2=x06+[-0.05,0.05,0.05,-0.05]-0.2;
yV3_2=y06+[-0.75,-0.75,0.75,0.75];

xcable1=[-9.5,-9.5,x06-0.25,x06-0.25];
ycable1=y06+[0.1,-0.1,-0.1,0.1];

xcable2=[-9.55,-9.45,-9.45,-9.55];
ycable2=[y01+1.6,y01+1.6,y06,y06];

xcable3=[-9.55,-9.45,-9.45,-9.55];
ycable3=[y01,y01,y04+0.35,y04+0.35];

xcable4=[-9.55,-9.45,-9.45,-9.55];
ycable4=[-7.0,-7.0,y04-0.2,y04-0.2];

xcable5=[-9.5,-9.5,9,9];
ycable5=-7.0+[0.1,-0.1,-0.1,0.1];

xcable6=[-9.55,-9.45,-9.45,-9.55]+5.5;
ycable6=[y01+1.6,y01+1.6,y06,y06];

xcable7=[-9.55,-9.45,-9.45,-9.55]+5.5;
ycable7=[y01,y01,y04+0.35,y04+0.35];

xcable8=[-9.55,-9.45,-9.45,-9.55]+5.5;
ycable8=[-7.0,-7.0,y04-0.2,y04-0.2];

xcable9=[x03,x03,x06+0.132,x06+0.132];
ycable9=y06+[0.1,-0.1,-0.1,0.1];

xcable10=[x03+1.2,x03+1.2,9,9];
ycable10=y06+[0.1,-0.1,-0.1,0.1];

xI_1=-9.5+[-0.05,0.05,0.05,0.25,0.0,-0.25,-0.05];
yI_1=2.5+[0.0,0.0,1.5,1.5,2.0,1.5,1.5];

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_11,yres_11,[1.0,1.0,1.0],...
xres_12,yres_12,[0.0,0.0,0.0],...
xres_21,yres_21,[1.0,1.0,1.0],...
xres_22,yres_22,[0.0,0.0,0.0],...
xres_31,yres_31,[1.0,1.0,1.0],...
xres_32,yres_32,[0.0,0.0,0.0],...
xV1_1,yV1_1,[0.0,0.0,0.0],...
xV1_2,yV1_2,[0.0,0.0,0.0],...
xV2_1,yV2_1,[0.0,0.0,0.0],...
xV2_2,yV2_2,[0.0,0.0,0.0],...
xV3_1,yV3_1,[0.0,0.0,0.0],...
xV3_2,yV3_2,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
xcable10,ycable10,[0.8,0.6,0.2],...
xI_1,yI_1,[0.0,0.0,0.0],...
'Linestyle','None')

text(-11,11,'Το κύκλωμα έχει δύο εξαρτημένες πηγές τάσης. Μηδενίζουμε (βραχυκυκλώνουμε) την ανεξάρτητη πηγή
V_{1}, οπότε μηδενίζεται')
text(-11,10,'και η πηγή aV_{1}. Προσθέτουμε στα άκρα A,B γωνιατή πηγή τάσης V, και προκαλείται ρεύμα I. Θα
έχουμε το κύκλωμα')
text(-10.5,0.7,'R_1','Color',[0.9,0.2,0.0])
text(-5.0,0.7,'R_2','Color',[0.9,0.2,0.0])
text(3.5,6.5,'R_3','Color',[0.9,0.2,0.0])
text(-10.5,-2.0,'V_1','Color',[0.0,0.2,0.9])
text(-5.0,-2.0,'aV_1','Color',[0.0,0.2,0.9])
text(-10.5,3.5,'I_1','Color',[0.7,0.0,0.7])
text(-0.5,6.5,'bI_1','Color',[0.0,0.2,0.9])
text(9.5,y06,'A','Color',[0.9,0.0,0.0])
text(9.5,-7.0,'B','Color',[0.9,0.0,0.0])

```



```

-0.03*cos(th1)+1.6*sin(th1),...
-0.03*cos(th1)+1.27*sin(th1),...
0.10*cos(th1)+1.2*sin(th1),...
-0.25*cos(th1)+1.0*sin(th1),...
0.10*cos(th1)+0.8*sin(th1),...
-0.25*cos(th1)+0.6*sin(th1),...
0.10*cos(th1)+0.4*sin(th1),...
-0.03*cos(th1)+0.33*sin(th1),...
-0.03*cos(th1)];

x02=-4;
y02=0;
th2=pi/2;

xres_21=x02+[0.25*sin(th2),0.25*sin(th2)+1.6*cos(th2),...
-0.25*sin(th2)+1.6*cos(th2),-0.25*sin(th2)];
yres_21=y02+[-0.25*cos(th2),-0.25*cos(th2)+1.6*sin(th2),...
0.25*cos(th2)+1.6*sin(th2),0.25*cos(th2)];

xres_22=x02+[-0.03*sin(th2),-0.03*sin(th2)+0.33*cos(th2),...
-0.25*sin(th2)+0.4*cos(th2),...
0.10*sin(th2)+0.6*cos(th2),...
-0.25*sin(th2)+0.8*cos(th2),...
0.10*sin(th2)+1.0*cos(th2),...
-0.25*sin(th2)+1.2*cos(th2),...
-0.03*sin(th2)+1.27*cos(th2),...
-0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.27*cos(th2),...
-0.10*sin(th2)+1.2*cos(th2),...
0.25*sin(th2)+1.0*cos(th2),...
-0.10*sin(th2)+0.8*cos(th2),...
0.25*sin(th2)+0.6*cos(th2),...
-0.10*sin(th2)+0.4*cos(th2),...
0.03*sin(th2)+0.33*cos(th2),...
0.03*sin(th2)];
yres_22=y02+[0.03*cos(th2),0.03*cos(th2)+0.33*sin(th2),...
0.25*cos(th2)+0.4*sin(th2),...
-0.10*cos(th2)+0.6*sin(th2),...
0.25*cos(th2)+0.8*sin(th2),...
-0.10*cos(th2)+1.0*sin(th2),...
0.25*cos(th2)+1.2*sin(th2),...
0.03*cos(th2)+1.27*sin(th2),...
0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.27*sin(th2),...
0.10*cos(th2)+1.2*sin(th2),...
-0.25*cos(th2)+1.0*sin(th2),...
0.10*cos(th2)+0.8*sin(th2),...
-0.25*cos(th2)+0.6*sin(th2),...
0.10*cos(th2)+0.4*sin(th2),...
-0.03*cos(th2)+0.33*sin(th2),...
-0.03*cos(th2)];

x03=3;
y03=5;
th3=0;

xres_31=x03+[0.40*sin(th3),0.40*sin(th3)+1.2*cos(th3),...
-0.40*sin(th3)+1.2*cos(th3),-0.40*sin(th3)];
yres_31=y03+[-0.40*cos(th3),-0.40*cos(th3)+1.2*sin(th3),...
0.40*cos(th3)+1.2*sin(th3),0.40*cos(th3)];

xres_32=x03+[-0.05*sin(th3),-0.05*sin(th3)+0.25*cos(th3),...
-0.40*sin(th3)+0.3*cos(th3),...
0.25*sin(th3)+0.45*cos(th3),...
-0.40*sin(th3)+0.6*cos(th3),...
0.25*sin(th3)+0.75*cos(th3),...
-0.40*sin(th3)+0.9*cos(th3),...
-0.05*sin(th3)+0.95*cos(th3),...
-0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+0.95*cos(th3),...
-0.25*sin(th3)+0.9*cos(th3),...
0.40*sin(th3)+0.75*cos(th3),...
-0.25*sin(th3)+0.6*cos(th3),...
0.40*sin(th3)+0.45*cos(th3),...
-0.25*sin(th3)+0.3*cos(th3),...
0.05*sin(th3)+0.25*cos(th3),...
0.05*sin(th3)];

```

```

yres_32=y03+[0.05*cos(th3),0.05*cos(th3)+0.25*sin(th3),...
0.40*cos(th3)+0.3*sin(th3),...
-0.25*cos(th3)+0.45*sin(th3),...
0.40*cos(th3)+0.6*sin(th3),...
-0.250*cos(th3)+0.75*sin(th3),...
0.40*cos(th3)+0.9*sin(th3),...
0.05*cos(th3)+0.95*sin(th3),...
0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+0.95*sin(th3),...
0.25*cos(th3)+0.9*sin(th3),...
-0.40*cos(th3)+0.75*sin(th3),...
0.25*cos(th3)+0.6*sin(th3),...
-0.40*cos(th3)+0.45*sin(th3),...
0.25*cos(th3)+0.3*sin(th3),...
-0.05*cos(th3)+0.25*sin(th3),...
-0.05*cos(th3)];

x04=-9.5;
y04=-3;

xV1_1=x04+[-1.0,1.0,1.0,-1.0];
yV1_1=y04+[-0.05,-0.05,0.05,0.05]+0.3;

xV1_2=x04+[-0.4,0.4,0.4,-0.4];
yV1_2=y04+[-0.1,-0.1,0.1,0.1]-0.1;

x05=-4;
y05=-3;

xV2_1=x05+[-1.0,1.0,1.0,-1.0];
yV2_1=y05+[-0.05,-0.05,0.05,0.05]+0.3;

xV2_2=x05+[-0.4,0.4,0.4,-0.4];
yV2_2=y05+[-0.1,-0.1,0.1,0.1]-0.1;

x06=0;
y06=5;

xV3_1=x06+[-0.032,0.032,0.032,-0.032]+0.1;
yV3_1=y06+[-1.5,-1.5,1.5,1.5];

xV3_2=x06+[-0.05,0.05,0.05,-0.05]-0.2;
yV3_2=y06+[-0.75,-0.75,0.75,0.75];

xcable1=[-9.5,-9.5,x06-0.25,x06-0.25];
ycable1=y06+[0.1,-0.1,-0.1,0.1];

xcable2=[-9.55,-9.45,-9.45,-9.55];
ycable2=[y01+1.6,y01+1.6,y06,y06];

xcable3=[-9.55,-9.45,-9.45,-9.55];
ycable3=[y01,y01,y04+0.35,y04+0.35];

xcable4=[-9.55,-9.45,-9.45,-9.55];
ycable4=[-7.0,-7.0,y04-0.2,y04-0.2];

xcable5=[-9.5,-9.5,9,9];
ycable5=-7.0+[0.1,-0.1,-0.1,0.1];

xcable6=[-9.55,-9.45,-9.45,-9.55]+5.5;
ycable6=[y01+1.6,y01+1.6,y06,y06];

xcable7=[-9.55,-9.45,-9.45,-9.55]+5.5;
ycable7=[y01,y01,y04+0.35,y04+0.35];

xcable8=[-9.55,-9.45,-9.45,-9.55]+5.5;
ycable8=[-7.0,-7.0,y04-0.2,y04-0.2];

xcable9=[x03,x03,x06+0.132,x06+0.132];
ycable9=y06+[0.1,-0.1,-0.1,0.1];

xcable10=[x03+1.2,x03+1.2,9,9];
ycable10=y06+[0.1,-0.1,-0.1,0.1];

xI_1=-9.5+[-0.05,0.05,0.05,0.25,0.0,-0.25,-0.05];
yI_1=2.5+[0.0,0.0,1.5,1.5,2.0,1.5,1.5];

```

```

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_11,yres_11,[1.0,1.0,1.0],...
xres_12,yres_12,[0.0,0.0,0.0],...
xres_21,yres_21,[1.0,1.0,1.0],...
xres_22,yres_22,[0.0,0.0,0.0],...
xres_31,yres_31,[1.0,1.0,1.0],...
xres_32,yres_32,[0.0,0.0,0.0],...
xV1_1,yV1_1,[0.0,0.0,0.0],...
xV1_2,yV1_2,[0.0,0.0,0.0],...
xV2_1,yV2_1,[0.0,0.0,0.0],...
xV2_2,yV2_2,[0.0,0.0,0.0],...
xV3_1,yV3_1,[0.0,0.0,0.0],...
xV3_2,yV3_2,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
xcable10,ycable10,[0.8,0.6,0.2],...
xI_1,yI_1,[0.0,0.0,0.0],...
    'Linestyle','None')

text(-11,11,'Το κύκλωμα έχει δύο εξαρτημένες πηγές τάσης. Μηδενίζουμε (βραχυκυκλώνουμε) την ανεξάρτητη πηγή
    V_{1}, οπότε μηδενίζεται')
text(-11,10,'και η πηγή aV_{1}). Προσθέτουμε στα άκρα A,B γνωστή πηγή τάσης V, και προκαλείται ρεύμα I. Θα
    έχουμε το κύκλωμα')
text(-10.5,0.7,'R_1','Color',[0.9,0.2,0.0])
text(-5.0,0.7,'R_2','Color',[0.9,0.2,0.0])
text(3.5,6.5,'R_3','Color',[0.9,0.2,0.0])
text(-10.5,-2.0,'V_1','Color',[0.0,0.2,0.9])
text(-5.0,-2.0,'aV_1','Color',[0.0,0.2,0.9])
text(-10.5,3.5,'I_1','Color',[0.7,0.0,0.7])
text(-0.5,6.5,'bI_1','Color',[0.0,0.2,0.9])
text(9.5,y06,'A','Color',[0.9,0.0,0.0])
text(9.5,-7.0,'B','Color',[0.9,0.0,0.0])

axis([-12,12,-12,12])
axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

elseif (snmeio==2)
axes(handles.axes1);
cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,8,8];

x01=-9.5;
y01=0;
th1=pi/2;

xres_11=x01+[0.25*sin(th1),0.25*sin(th1)+1.6*cos(th1),...
-0.25*sin(th1)+1.6*cos(th1),-0.25*sin(th1)];
yres_11=y01+[-0.25*cos(th1),-0.25*cos(th1)+1.6*sin(th1),...
0.25*cos(th1)+1.6*sin(th1),0.25*cos(th1)];

xres_12=x01+[-0.03*sin(th1),-0.03*sin(th1)+0.33*cos(th1),...
-0.25*sin(th1)+0.4*cos(th1),...
0.10*sin(th1)+0.6*cos(th1),...
-0.25*sin(th1)+0.8*cos(th1),...
0.10*sin(th1)+1.0*cos(th1),...
-0.25*sin(th1)+1.2*cos(th1),...
-0.03*sin(th1)+1.27*cos(th1),...
-0.03*sin(th1)+1.6*cos(th1),...
0.03*sin(th1)+1.6*cos(th1),...
0.03*sin(th1)+1.27*cos(th1),...
-0.10*sin(th1)+1.2*cos(th1),...
0.25*sin(th1)+1.0*cos(th1),...
-0.10*sin(th1)+0.8*cos(th1),...
0.25*sin(th1)+0.6*cos(th1),...

```

```

-0.10*sin(th1)+0.4*cos(th1),...
0.03*sin(th1)+0.33*cos(th1),...
0.03*sin(th1)];
yres_12=y01+[0.03*cos(th1),0.03*cos(th1)+0.33*sin(th1),...
0.25*cos(th1)+0.4*sin(th1),...
-0.10*cos(th1)+0.6*sin(th1),...
0.25*cos(th1)+0.8*sin(th1),...
-0.10*cos(th1)+1.0*sin(th1),...
0.25*cos(th1)+1.2*sin(th1),...
0.03*cos(th1)+1.27*sin(th1),...
0.03*cos(th1)+1.6*sin(th1),...
-0.03*cos(th1)+1.6*sin(th1),...
-0.03*cos(th1)+1.27*sin(th1),...
0.10*cos(th1)+1.2*sin(th1),...
-0.25*cos(th1)+1.0*sin(th1),...
0.10*cos(th1)+0.8*sin(th1),...
-0.25*cos(th1)+0.6*sin(th1),...
0.10*cos(th1)+0.4*sin(th1),...
-0.03*cos(th1)+0.33*sin(th1),...
-0.03*cos(th1)];

x02=-4;
y02=0;
th2=pi/2;

xres_21=x02+[0.25*sin(th2),0.25*sin(th2)+1.6*cos(th2),...
-0.25*sin(th2)+1.6*cos(th2),-0.25*sin(th2)];
yres_21=y02+[-0.25*cos(th2),-0.25*cos(th2)+1.6*sin(th2),...
0.25*cos(th2)+1.6*sin(th2),0.25*cos(th2)];

xres_22=x02+[-0.03*sin(th2),-0.03*sin(th2)+0.33*cos(th2),...
-0.25*sin(th2)+0.4*cos(th2),...
0.10*sin(th2)+0.6*cos(th2),...
-0.25*sin(th2)+0.8*cos(th2),...
0.10*sin(th2)+1.0*cos(th2),...
-0.25*sin(th2)+1.2*cos(th2),...
-0.03*sin(th2)+1.27*cos(th2),...
-0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.27*cos(th2),...
-0.10*sin(th2)+1.2*cos(th2),...
0.25*sin(th2)+1.0*cos(th2),...
-0.10*sin(th2)+0.8*cos(th2),...
0.25*sin(th2)+0.6*cos(th2),...
-0.10*sin(th2)+0.4*cos(th2),...
0.03*sin(th2)+0.33*cos(th2),...
0.03*sin(th2)];
yres_22=y02+[0.03*cos(th2),0.03*cos(th2)+0.33*sin(th2),...
0.25*cos(th2)+0.4*sin(th2),...
-0.10*cos(th2)+0.6*sin(th2),...
0.25*cos(th2)+0.8*sin(th2),...
-0.10*cos(th2)+1.0*sin(th2),...
0.25*cos(th2)+1.2*sin(th2),...
0.03*cos(th2)+1.27*sin(th2),...
0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.27*sin(th2),...
0.10*cos(th2)+1.2*sin(th2),...
-0.25*cos(th2)+1.0*sin(th2),...
0.10*cos(th2)+0.8*sin(th2),...
-0.25*cos(th2)+0.6*sin(th2),...
0.10*cos(th2)+0.4*sin(th2),...
-0.03*cos(th2)+0.33*sin(th2),...
-0.03*cos(th2)];

x03=3;
y03=5;
th3=0;

xres_31=x03+[0.40*sin(th3),0.40*sin(th3)+1.2*cos(th3),...
-0.40*sin(th3)+1.2*cos(th3),-0.40*sin(th3)];
yres_31=y03+[-0.40*cos(th3),-0.40*cos(th3)+1.2*sin(th3),...
0.40*cos(th3)+1.2*sin(th3),0.40*cos(th3)];

xres_32=x03+[-0.05*sin(th3),-0.05*sin(th3)+0.25*cos(th3),...
-0.40*sin(th3)+0.3*cos(th3),...
0.25*sin(th3)+0.45*cos(th3),...
-0.40*sin(th3)+0.6*cos(th3),...
0.25*sin(th3)+0.75*cos(th3),...
-0.40*sin(th3)+0.9*cos(th3),...

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-0.05*sin(th3)+0.95*cos(th3),...
-0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+0.95*cos(th3),...
-0.25*sin(th3)+0.9*cos(th3),...
0.40*sin(th3)+0.75*cos(th3),...
-0.25*sin(th3)+0.6*cos(th3),...
0.40*sin(th3)+0.45*cos(th3),...
-0.25*sin(th3)+0.3*cos(th3),...
0.05*sin(th3)+0.25*cos(th3),...
0.05*sin(th3)];
yres_32=y03+[0.05*cos(th3),0.05*cos(th3)+0.25*sin(th3),...
0.40*cos(th3)+0.3*sin(th3),...
-0.25*cos(th3)+0.45*sin(th3),...
0.40*cos(th3)+0.6*sin(th3),...
-0.250*cos(th3)+0.75*sin(th3),...
0.40*cos(th3)+0.9*sin(th3),...
0.05*cos(th3)+0.95*sin(th3),...
0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+0.95*sin(th3),...
0.25*cos(th3)+0.9*sin(th3),...
-0.40*cos(th3)+0.75*sin(th3),...
0.25*cos(th3)+0.6*sin(th3),...
-0.40*cos(th3)+0.45*sin(th3),...
0.25*cos(th3)+0.3*sin(th3),...
-0.05*cos(th3)+0.25*sin(th3),...
-0.05*cos(th3)];

x04=9.0;
y04=-2.5;

xV_1=x04+[-1.0,1.0,1.0,-1.0];
yV_1=y04+[-0.05,-0.05,0.05,0.05]+0.3;

xV_2=x04+[-0.4,0.4,0.4,-0.4];
yV_2=y04+[-0.1,-0.1,0.1,0.1]-0.1;

x05=-4;
y05=-3;

x06=0;
y06=5;

xV3_1=x06+[-0.032,0.032,0.032,-0.032]+0.1;
yV3_1=y06+[-1.5,-1.5,1.5,1.5];

xV3_2=x06+[-0.05,0.05,0.05,-0.05]-0.2;
yV3_2=y06+[-0.75,-0.75,0.75,0.75];

xcable1=[-9.5,-9.5,x06-0.25,x06-0.25];
ycable1=y06+[0.1,-0.1,-0.1,0.1];

xcable2=[-9.55,-9.45,-9.45,-9.55];
ycable2=[y01+1.6,y01+1.6,y06,y06];

xcable3=[-9.55,-9.45,-9.45,-9.55];
ycable3=[y01,y01,y04+0.35,y04+0.35];

xcable4=[-9.55,-9.45,-9.45,-9.55];
ycable4=[-7.0,-7.0,y04+0.35,y04+0.35];

xcable5=[-9.5,-9.5,9,9];
ycable5=-7.0+[0.1,-0.1,-0.1,0.1];

xcable6=[-9.55,-9.45,-9.45,-9.55]+5.5;
ycable6=[y01+1.6,y01+1.6,y06,y06];

xcable7=[-9.55,-9.45,-9.45,-9.55]+5.5;
ycable7=[y01,y01,y04+0.35,y04+0.35];

xcable8=[-9.55,-9.45,-9.45,-9.55]+5.5;
ycable8=[-7.0,-7.0,y04+0.35,y04+0.35];

xcable9=[x03,x03,x06+0.132,x06+0.132];
ycable9=y06+[0.1,-0.1,-0.1,0.1];

xcable10=[x03+1.2,x03+1.2,9,9];
ycable10=y06+[0.1,-0.1,-0.1,0.1];

```

```

xcable11=[9.05,8.95,8.95,9.05];
ycable11=[y04+0.35,y04+0.35,y06,y06];

xcable12=[9.05,8.95,8.95,9.05];
ycable12=[y04-0.2,y04-0.2,-7.0,-7.0];

xI_1=-9.5+[-0.05,0.05,0.05,0.25,0.0,-0.25,-0.05];
yI_1=2.5+[0.0,0.0,1.5,1.5,2.0,1.5,1.5];

xII_1=9.0+[-0.05,0.05,0.05,0.25,0.0,-0.25,-0.05];
yII_1=1.5+[0.0,0.0,1.5,1.5,2.0,1.5,1.5];

th1=0:-0.01:-pi;
th2=-pi:0.01:0;

xcirc1_1=-7.0+[1.0,1.1,1.1*cos(th1),-1.0,1.0*cos(th2)];
ycirc1_1=0.0+[0.0,0.0,1.1*sin(th1),0.0,1.0*sin(th2)];

xcirc1_2=-8.0+[0.5,0.0,-0.5];
ycirc1_2=[0.0,0.5,0.0];

xcirc2_1=3.0+[1.0,1.1,1.1*cos(th1),-1.0,1.0*cos(th2)];
ycirc2_1=0.0+[0.0,0.0,1.1*sin(th1),0.0,1.0*sin(th2)];

xcirc2_2=2.0+[0.5,0.0,-0.5];
ycirc2_2=[0.0,0.5,0.0];

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_11,yres_11,[1.0,1.0,1.0],...
xres_12,yres_12,[0.0,0.0,0.0],...
xres_21,yres_21,[1.0,1.0,1.0],...
xres_22,yres_22,[0.0,0.0,0.0],...
xres_31,yres_31,[1.0,1.0,1.0],...
xres_32,yres_32,[0.0,0.0,0.0],...
xV_1,yV_1,[0.0,0.0,0.0],...
xV_2,yV_2,[0.0,0.0,0.0],...
xV3_1,yV3_1,[0.0,0.0,0.0],...
xV3_2,yV3_2,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
xcable10,ycable10,[0.8,0.6,0.2],...
xcable11,ycable11,[0.8,0.6,0.2],...
xcable12,ycable12,[0.8,0.6,0.2],...
xI_1,yI_1,[0.0,0.0,0.0],...
xII_1,yII_1,[0.0,0.0,0.0],...
xcirc1_1,ycirc1_1,[0.0,0.0,0.0],...
xcirc1_2,ycirc1_2,[0.0,0.0,0.0],...
xcirc2_1,ycirc2_1,[0.0,0.0,0.0],...
xcirc2_2,ycirc2_2,[0.0,0.0,0.0],...
'Linestyle','None')

text(-11,11,'Από τις εξισώσεις των βρόχων έχουμε (I_1=J_1), (I=-J_2) τις παρακάτω εξισώσεις:')
text(-11,10,'J_1(R_1+R_2)-J_2R_2=0, (b+R_2)J_1-(R_2+R_3)J_2=V. Από αυτές θα έχουμε για
την αντίσταση Thevenin')
text(-11,9,'R_T=(V/I)=(R_1+R_2)(R_2+R_3)-R_2(b+R_2))/(R_1+R_2)=')
text(-2.2,9.2,nRT)
text(-1.3,9.2,'Ohm')
text(-10.5,0.7,'R_1','Color',[0.9,0.2,0.0])
text(-5.0,0.7,'R_2','Color',[0.9,0.2,0.0])
text(3.5,6.5,'R_3','Color',[0.9,0.2,0.0])
text(-10.5,3.5,'I_1','Color',[0.7,0.0,0.7])
text(-0.5,6.5,'bI_1','Color',[0.0,0.2,0.9])
text(9.5,y06,'A','Color',[0.9,0.0,0.0])
text(9.5,-7.0,'B','Color',[0.9,0.0,0.0])
text(8.5,2.5,'I','Color',[0.7,0.0,0.7])
text(8.5,-1.7,'V','Color',[0.0,0.0,0.9])
text(-7.0,0.0,'J_1','Color',[0.9,0.0,0.0])
text(3.0,0.0,'J_2','Color',[0.9,0.0,0.0])

```

```

axis([-12,12,-12,12])
axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

elseif (snmeio==3)
axes(handles.axes1);
cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,7,7];

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

x01=-9.5;
y01=0;
th1=pi/2;

x02=-4;
y02=0;
th2=pi/2;

x03=3;
y03=5;
th3=0;

xres_31=x03+[0.40*sin(th3),0.40*sin(th3)+1.2*cos(th3),...
-0.40*sin(th3)+1.2*cos(th3),-0.40*sin(th3)];
yres_31=y03+[-0.40*cos(th3),-0.40*cos(th3)+1.2*sin(th3),...
0.40*cos(th3)+1.2*sin(th3),0.40*cos(th3)];

xres_32=x03+[-0.05*sin(th3),-0.05*sin(th3)+0.25*cos(th3),...
-0.40*sin(th3)+0.3*cos(th3),...
0.25*sin(th3)+0.45*cos(th3),...
-0.40*sin(th3)+0.6*cos(th3),...
0.25*sin(th3)+0.75*cos(th3),...
-0.40*sin(th3)+0.9*cos(th3),...
-0.05*sin(th3)+0.95*cos(th3),...
-0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+0.95*cos(th3),...
-0.25*sin(th3)+0.9*cos(th3),...
0.40*sin(th3)+0.75*cos(th3),...
-0.25*sin(th3)+0.6*cos(th3),...
0.40*sin(th3)+0.45*cos(th3),...
-0.25*sin(th3)+0.3*cos(th3),...
0.05*sin(th3)+0.25*cos(th3),...
0.05*sin(th3)];
yres_32=y03+[0.05*cos(th3),0.05*cos(th3)+0.25*sin(th3),...
0.40*cos(th3)+0.3*sin(th3),...
-0.25*cos(th3)+0.45*sin(th3),...
0.40*cos(th3)+0.6*sin(th3),...
-0.25*cos(th3)+0.75*sin(th3),...
0.40*cos(th3)+0.9*sin(th3),...
0.05*cos(th3)+0.95*sin(th3),...
0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+0.95*sin(th3),...
0.25*cos(th3)+0.9*sin(th3),...
-0.40*cos(th3)+0.75*sin(th3),...
0.25*cos(th3)+0.6*sin(th3),...
-0.40*cos(th3)+0.45*sin(th3),...
0.25*cos(th3)+0.3*sin(th3),...
-0.05*cos(th3)+0.25*sin(th3),...
-0.05*cos(th3)];

x04=-9.5;
y04=-3;

x05=-4;
y05=-3;

xv2_1=x05+[-1.0,1.0,1.0,-1.0];
yv2_1=y05+[-0.05,-0.05,0.05,0.05]+0.3;

xv2_2=x05+[-0.4,0.4,0.4,-0.4];

```

```

yV2_2=y05+[-0.1,-0.1,0.1,0.1]-0.1;

x06=0;
y06=5;

xcable5=[-4.0,-4.0,9,9];
ycable5=-7.0+[0.1,-0.1,-0.1,0.1];

xcable6=[-9.55,-9.45,-9.45,-9.55]+5.5;
ycable6=[y01,y01,y06,y06];

xcable7=[-9.55,-9.45,-9.45,-9.55]+5.5;
ycable7=[y01,y01,y04+0.35,y04+0.35];

xcable8=[-9.55,-9.45,-9.45,-9.55]+5.5;
ycable8=[-7.0,-7.0,y04-0.2,y04-0.2];

xcable9=[x03,x03,-4.0,-4.0];
ycable9=y06+[0.1,-0.1,-0.1,0.1];

xcable10=[x03+1.2,x03+1.2,9,9];
ycable10=y06+[0.1,-0.1,-0.1,0.1];

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_31,yres_31,[1.0,1.0,1.0],...
xres_32,yres_32,[0.0,0.0,0.0],...
xV2_1,yV2_1,[0.0,0.0,0.0],...
xV2_2,yV2_2,[0.0,0.0,0.0],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
xcable10,ycable10,[0.8,0.6,0.2],...
'LineStyle','None')

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

text(-11,11,'Για τον υπολογισμό της τάσης Thevenin V_{T}, από το αρχικό κύκλωμα έχουμε')
text(-11,10,'V_{AB}=V_{T}=bI_{1}+R_{2}I_{1}+aV_{1}. Από τον βρόχο έχουμε V_{1}-I_{1}R_{1}-I_{1}R_{2}-aV_{1}=0.')
text(-11,9,'Επιλύοντας ως προς I_{1} και αντικαθιστώντας στην παραπάνω σχέση έχουμε')
text(-11,8,'V_{T}=V_{1}((b+R_{2}))(1-a)+a(R_{1}+R_{2}))/ (R_{1}+R_{2})=')
text(-3.5,8.2,nVT)
text(-2.5,8.2,'Volt')
text(9.5,y06,'A','Color',[0.9,0.0,0.0])
text(9.5,-7.0,'B','Color',[0.9,0.0,0.0])
text(3.5,6.5,'R_T','Color',[0.9,0.2,0.0])
text(-5.0,-2.0,'V_T','Color',[0.0,0.2,0.9])

axis([-12,12,-12,12])
axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

else
end

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

% --- Executes on button press in pushbutton3.
function pushbutton3_Callback(hObject, eventdata, handles)
% hObject handle to pushbutton3 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

global R1;
global R2;
global R3;
global V1;
global a;
global b;

global snmeio;

```



```

snmeio=snmeio-1;

if (snmeio==0)
    snmeio=3;
end
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
RT= (R1+R2) * (R2+R3) -R2* (b+R2) ) / (R1+R2);
nRT=num2str (0.01*round (100*RT));
VT=V1* ( (b+R2) * (1-a)+a*(R1+R2) ) / (R1+R2);
nVT=num2str (0.01*round (100*VT));

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
if (snmeio==1)
    axes(handles.axes1);
    cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
    x_back=[-12,12,12,-12];
    y_back=[-12,-12,12,12];

    x_tableau=[-11,11,11,-11];
    y_tableau=[-11,-11,9,9];

    x01=-9.5;
    y01=0;
    th1=pi/2;

    xres_11=x01+[0.25*sin(th1),0.25*sin(th1)+1.6*cos(th1),...
        -0.25*sin(th1)+1.6*cos(th1),-0.25*sin(th1)];
    yres_11=y01+[-0.25*cos(th1),-0.25*cos(th1)+1.6*sin(th1),...
        0.25*cos(th1)+1.6*sin(th1),0.25*cos(th1)];

    xres_12=x01+[-0.03*sin(th1),-0.03*sin(th1)+0.33*cos(th1),...
        -0.25*sin(th1)+0.4*cos(th1),...
        0.10*sin(th1)+0.6*cos(th1),...
        -0.25*sin(th1)+0.8*cos(th1),...
        0.10*sin(th1)+1.0*cos(th1),...
        -0.25*sin(th1)+1.2*cos(th1),...
        -0.03*sin(th1)+1.27*cos(th1),...
        -0.03*sin(th1)+1.6*cos(th1),...
        0.03*sin(th1)+1.6*cos(th1),...
        0.03*sin(th1)+1.27*cos(th1),...
        -0.10*sin(th1)+1.2*cos(th1),...
        0.25*sin(th1)+1.0*cos(th1),...
        -0.10*sin(th1)+0.8*cos(th1),...
        0.25*sin(th1)+0.6*cos(th1),...
        -0.10*sin(th1)+0.4*cos(th1),...
        0.03*sin(th1)+0.33*cos(th1),...
        0.03*sin(th1)];
    yres_12=y01+[0.03*cos(th1),0.03*cos(th1)+0.33*sin(th1),...
        0.25*cos(th1)+0.4*sin(th1),...
        -0.10*cos(th1)+0.6*sin(th1),...
        0.25*cos(th1)+0.8*sin(th1),...
        -0.10*cos(th1)+1.0*sin(th1),...
        0.25*cos(th1)+1.2*sin(th1),...
        0.03*cos(th1)+1.27*sin(th1),...
        0.03*cos(th1)+1.6*sin(th1),...
        -0.03*cos(th1)+1.6*sin(th1),...
        -0.03*cos(th1)+1.27*sin(th1),...
        0.10*cos(th1)+1.2*sin(th1),...
        -0.25*cos(th1)+1.0*sin(th1),...
        0.10*cos(th1)+0.8*sin(th1),...
        -0.25*cos(th1)+0.6*sin(th1),...
        0.10*cos(th1)+0.4*sin(th1),...
        -0.03*cos(th1)+0.33*sin(th1),...
        -0.03*cos(th1)];

    x02=-4;
    y02=0;
    th2=pi/2;

    xres_21=x02+[0.25*sin(th2),0.25*sin(th2)+1.6*cos(th2),...
        -0.25*sin(th2)+1.6*cos(th2),-0.25*sin(th2)];
    yres_21=y02+[-0.25*cos(th2),-0.25*cos(th2)+1.6*sin(th2),...
        0.25*cos(th2)+1.6*sin(th2),0.25*cos(th2)];

    xres_22=x02+[-0.03*sin(th2),-0.03*sin(th2)+0.33*cos(th2),...
        -0.25*sin(th2)+0.4*cos(th2),...
        0.10*sin(th2)+0.6*cos(th2),...

```

```

-0.25*sin(th2)+0.8*cos(th2),...
0.10*sin(th2)+1.0*cos(th2),...
-0.25*sin(th2)+1.2*cos(th2),...
-0.03*sin(th2)+1.27*cos(th2),...
-0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.27*cos(th2),...
-0.10*sin(th2)+1.2*cos(th2),...
0.25*sin(th2)+1.0*cos(th2),...
-0.10*sin(th2)+0.8*cos(th2),...
0.25*sin(th2)+0.6*cos(th2),...
-0.10*sin(th2)+0.4*cos(th2),...
0.03*sin(th2)+0.33*cos(th2),...
0.03*sin(th2)];
yres_22=y02+[0.03*cos(th2),0.03*cos(th2)+0.33*sin(th2),...
0.25*cos(th2)+0.4*sin(th2),...
-0.10*cos(th2)+0.6*sin(th2),...
0.25*cos(th2)+0.8*sin(th2),...
-0.10*cos(th2)+1.0*sin(th2),...
0.25*cos(th2)+1.2*sin(th2),...
0.03*cos(th2)+1.27*sin(th2),...
0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.27*sin(th2),...
0.10*cos(th2)+1.2*sin(th2),...
-0.25*cos(th2)+1.0*sin(th2),...
0.10*cos(th2)+0.8*sin(th2),...
-0.25*cos(th2)+0.6*sin(th2),...
0.10*cos(th2)+0.4*sin(th2),...
-0.03*cos(th2)+0.33*sin(th2),...
-0.03*cos(th2)];

x03=3;
y03=5;
th3=0;

xres_31=x03+[0.40*sin(th3),0.40*sin(th3)+1.2*cos(th3),...
-0.40*sin(th3)+1.2*cos(th3),-0.40*sin(th3)];
yres_31=y03+[-0.40*cos(th3),-0.40*cos(th3)+1.2*sin(th3),...
0.40*cos(th3)+1.2*sin(th3),0.40*cos(th3)];

xres_32=x03+[-0.05*sin(th3),-0.05*sin(th3)+0.25*cos(th3),...
-0.40*sin(th3)+0.3*cos(th3),...
0.25*sin(th3)+0.45*cos(th3),...
-0.40*sin(th3)+0.6*cos(th3),...
0.25*sin(th3)+0.75*cos(th3),...
-0.40*sin(th3)+0.9*cos(th3),...
-0.05*sin(th3)+0.95*cos(th3),...
-0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+0.95*cos(th3),...
-0.25*sin(th3)+0.9*cos(th3),...
0.40*sin(th3)+0.75*cos(th3),...
-0.25*sin(th3)+0.6*cos(th3),...
0.40*sin(th3)+0.45*cos(th3),...
-0.25*sin(th3)+0.3*cos(th3),...
0.05*sin(th3)+0.25*cos(th3),...
0.05*sin(th3)];
yres_32=y03+[0.05*cos(th3),0.05*cos(th3)+0.25*sin(th3),...
0.40*cos(th3)+0.3*sin(th3),...
-0.25*cos(th3)+0.45*sin(th3),...
0.40*cos(th3)+0.6*sin(th3),...
-0.250*cos(th3)+0.75*sin(th3),...
0.40*cos(th3)+0.9*sin(th3),...
0.05*cos(th3)+0.95*sin(th3),...
0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+0.95*sin(th3),...
0.25*cos(th3)+0.9*sin(th3),...
-0.40*cos(th3)+0.75*sin(th3),...
0.25*cos(th3)+0.6*sin(th3),...
-0.40*cos(th3)+0.45*sin(th3),...
0.25*cos(th3)+0.3*sin(th3),...
-0.05*cos(th3)+0.25*sin(th3),...
-0.05*cos(th3)];

x04=-9.5;
y04=-3;

xv1_1=x04+[-1.0,1.0,1.0,-1.0];
yv1_1=y04+[-0.05,-0.05,0.05,0.05]+0.3;

```

```

xV1_2=x04+[-0.4,0.4,0.4,-0.4];
yV1_2=y04+[-0.1,-0.1,0.1,0.1]-0.1;

x05=-4;
y05=-3;

xV2_1=x05+[-1.0,1.0,1.0,-1.0];
yV2_1=y05+[-0.05,-0.05,0.05,0.05]+0.3;

xV2_2=x05+[-0.4,0.4,0.4,-0.4];
yV2_2=y05+[-0.1,-0.1,0.1,0.1]-0.1;

x06=0;
y06=5;

xV3_1=x06+[-0.032,0.032,0.032,-0.032]+0.1;
yV3_1=y06+[-1.5,-1.5,1.5,1.5];

xV3_2=x06+[-0.05,0.05,0.05,-0.05]-0.2;
yV3_2=y06+[-0.75,-0.75,0.75,0.75];

xcable1=[-9.5,-9.5,x06-0.25,x06-0.25];
ycable1=y06+[0.1,-0.1,-0.1,0.1];

xcable2=[-9.55,-9.45,-9.45,-9.55];
ycable2=[y01+1.6,y01+1.6,y06,y06];

xcable3=[-9.55,-9.45,-9.45,-9.55];
ycable3=[y01,y01,y04+0.35,y04+0.35];

xcable4=[-9.55,-9.45,-9.45,-9.55];
ycable4=[-7.0,-7.0,y04-0.2,y04-0.2];

xcable5=[-9.5,-9.5,9,9];
ycable5=-7.0+[0.1,-0.1,-0.1,0.1];

xcable6=[-9.55,-9.45,-9.45,-9.55]+5.5;
ycable6=[y01+1.6,y01+1.6,y06,y06];

xcable7=[-9.55,-9.45,-9.45,-9.55]+5.5;
ycable7=[y01,y01,y04+0.35,y04+0.35];

xcable8=[-9.55,-9.45,-9.45,-9.55]+5.5;
ycable8=[-7.0,-7.0,y04-0.2,y04-0.2];

xcable9=[x03,x03,x06+0.132,x06+0.132];
ycable9=y06+[0.1,-0.1,-0.1,0.1];

xcable10=[x03+1.2,x03+1.2,9,9];
ycable10=y06+[0.1,-0.1,-0.1,0.1];

xI_1=-9.5+[-0.05,0.05,0.05,0.25,0.0,-0.25,-0.05];
yI_1=2.5+[0.0,0.0,1.5,1.5,2.0,1.5,1.5];

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_11,yres_11,[1.0,1.0,1.0],...
xres_12,yres_12,[0.0,0.0,0.0],...
xres_21,yres_21,[1.0,1.0,1.0],...
xres_22,yres_22,[0.0,0.0,0.0],...
xres_31,yres_31,[1.0,1.0,1.0],...
xres_32,yres_32,[0.0,0.0,0.0],...
xV1_1,yV1_1,[0.0,0.0,0.0],...
xV1_2,yV1_2,[0.0,0.0,0.0],...
xV2_1,yV2_1,[0.0,0.0,0.0],...
xV2_2,yV2_2,[0.0,0.0,0.0],...
xV3_1,yV3_1,[0.0,0.0,0.0],...
xV3_2,yV3_2,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...

```

```

        xcable9,ycable9,[0.8,0.6,0.2],...
        xcable10,ycable10,[0.8,0.6,0.2],...
        xI_1,yI_1,[0.0,0.0,0.0],...
        'Linestyle','None')

text(-11,11,'Το κύκλωμα έχει δύο εξαρτημένες πηγές τάσης. Μηδενίζουμε (βραχυκυκλώνουμε) την ανεξάρτητη πηγή
V_{1}, οπότε μηδενίζεται')
text(-11,10,'και η πηγή aV_{1}. Προσθέτουμε στα άκρα A,B γνωστή πηγή τάσης V, και προκαλείται ρεύμα I. Θα
έχουμε το κύκλωμα')
text(-10.5,0.7,'R_1','Color',[0.9,0.2,0.0])
text(-5.0,0.7,'R_2','Color',[0.9,0.2,0.0])
text(3.5,6.5,'R_3','Color',[0.9,0.2,0.0])
text(-10.5,-2.0,'V_1','Color',[0.0,0.2,0.9])
text(-5.0,-2.0,'aV_1','Color',[0.0,0.2,0.9])
text(-10.5,3.5,'I_1','Color',[0.7,0.0,0.7])
text(-0.5,6.5,'bI_1','Color',[0.0,0.2,0.9])
text(9.5,y06,'A','Color',[0.9,0.0,0.0])
text(9.5,-7.0,'B','Color',[0.9,0.0,0.0])

axis([-12,12,-12,12])
axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

elseif (snmeio==2)
axes(handles.axes1);
cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,8,8];

x01=-9.5;
y01=0;
th1=pi/2;

xres_11=x01+[0.25*sin(th1),0.25*sin(th1)+1.6*cos(th1),...
-0.25*sin(th1)+1.6*cos(th1),-0.25*sin(th1)];
yres_11=y01+[-0.25*cos(th1),-0.25*cos(th1)+1.6*sin(th1),...
0.25*cos(th1)+1.6*sin(th1),0.25*cos(th1)];

xres_12=x01+[-0.03*sin(th1),-0.03*sin(th1)+0.33*cos(th1),...
-0.25*sin(th1)+0.4*cos(th1),...
0.10*sin(th1)+0.6*cos(th1),...
-0.25*sin(th1)+0.8*cos(th1),...
0.10*sin(th1)+1.0*cos(th1),...
-0.25*sin(th1)+1.2*cos(th1),...
-0.03*sin(th1)+1.27*cos(th1),...
-0.03*sin(th1)+1.6*cos(th1),...
0.03*sin(th1)+1.6*cos(th1),...
0.03*sin(th1)+1.27*cos(th1),...
-0.10*sin(th1)+1.2*cos(th1),...
0.25*sin(th1)+1.0*cos(th1),...
-0.10*sin(th1)+0.8*cos(th1),...
0.25*sin(th1)+0.6*cos(th1),...
-0.10*sin(th1)+0.4*cos(th1),...
0.03*sin(th1)+0.33*cos(th1),...
0.03*sin(th1)];
yres_12=y01+[0.03*cos(th1),0.03*cos(th1)+0.33*sin(th1),...
0.25*cos(th1)+0.4*sin(th1),...
-0.10*cos(th1)+0.6*sin(th1),...
0.25*cos(th1)+0.8*sin(th1),...
-0.10*cos(th1)+1.0*sin(th1),...
0.25*cos(th1)+1.2*sin(th1),...
0.03*cos(th1)+1.27*sin(th1),...
0.03*cos(th1)+1.6*sin(th1),...
-0.03*cos(th1)+1.6*sin(th1),...
-0.03*cos(th1)+1.27*sin(th1),...
0.10*cos(th1)+1.2*sin(th1),...
-0.25*cos(th1)+1.0*sin(th1),...
0.10*cos(th1)+0.8*sin(th1),...
-0.25*cos(th1)+0.6*sin(th1),...
0.10*cos(th1)+0.4*sin(th1),...
-0.03*cos(th1)+0.33*sin(th1),...
-0.03*cos(th1)];

x02=-4;

```

```

        y02=0;
        th2=pi/2;

        xres_21=x02+[0.25*sin(th2),0.25*sin(th2)+1.6*cos(th2),...
        -0.25*sin(th2)+1.6*cos(th2),-0.25*sin(th2)];
        yres_21=y02+[-0.25*cos(th2),-0.25*cos(th2)+1.6*sin(th2),...
        0.25*cos(th2)+1.6*sin(th2),0.25*cos(th2)];

        xres_22=x02+[-0.03*sin(th2),-0.03*sin(th2)+0.33*cos(th2),...
        -0.25*sin(th2)+0.4*cos(th2),...
        0.10*sin(th2)+0.6*cos(th2),...
        -0.25*sin(th2)+0.8*cos(th2),...
        0.10*sin(th2)+1.0*cos(th2),...
        -0.25*sin(th2)+1.2*cos(th2),...
        -0.03*sin(th2)+1.27*cos(th2),...
        -0.03*sin(th2)+1.6*cos(th2),...
        0.03*sin(th2)+1.6*cos(th2),...
        0.03*sin(th2)+1.27*cos(th2),...
        -0.10*sin(th2)+1.2*cos(th2),...
        0.25*sin(th2)+1.0*cos(th2),...
        -0.10*sin(th2)+0.8*cos(th2),...
        0.25*sin(th2)+0.6*cos(th2),...
        -0.10*sin(th2)+0.4*cos(th2),...
        0.03*sin(th2)+0.33*cos(th2),...
        0.03*sin(th2)];
        yres_22=y02+[0.03*cos(th2),0.03*cos(th2)+0.33*sin(th2),...
        0.25*cos(th2)+0.4*sin(th2),...
        -0.10*cos(th2)+0.6*sin(th2),...
        0.25*cos(th2)+0.8*sin(th2),...
        -0.10*cos(th2)+1.0*sin(th2),...
        0.25*cos(th2)+1.2*sin(th2),...
        0.03*cos(th2)+1.27*sin(th2),...
        0.03*cos(th2)+1.6*sin(th2),...
        -0.03*cos(th2)+1.6*sin(th2),...
        -0.03*cos(th2)+1.27*sin(th2),...
        0.10*cos(th2)+1.2*sin(th2),...
        -0.25*cos(th2)+1.0*sin(th2),...
        0.10*cos(th2)+0.8*sin(th2),...
        -0.25*cos(th2)+0.6*sin(th2),...
        0.10*cos(th2)+0.4*sin(th2),...
        -0.03*cos(th2)+0.33*sin(th2),...
        -0.03*cos(th2)];

        x03=3;
        y03=5;
        th3=0;

        xres_31=x03+[0.40*sin(th3),0.40*sin(th3)+1.2*cos(th3),...
        -0.40*sin(th3)+1.2*cos(th3),-0.40*sin(th3)];
        yres_31=y03+[-0.40*cos(th3),-0.40*cos(th3)+1.2*sin(th3),...
        0.40*cos(th3)+1.2*sin(th3),0.40*cos(th3)];

        xres_32=x03+[-0.05*sin(th3),-0.05*sin(th3)+0.25*cos(th3),...
        -0.40*sin(th3)+0.3*cos(th3),...
        0.25*sin(th3)+0.45*cos(th3),...
        -0.40*sin(th3)+0.6*cos(th3),...
        0.25*sin(th3)+0.75*cos(th3),...
        -0.40*sin(th3)+0.9*cos(th3),...
        -0.05*sin(th3)+0.95*cos(th3),...
        -0.05*sin(th3)+1.2*cos(th3),...
        0.05*sin(th3)+1.2*cos(th3),...
        0.05*sin(th3)+0.95*cos(th3),...
        -0.25*sin(th3)+0.9*cos(th3),...
        0.40*sin(th3)+0.75*cos(th3),...
        -0.25*sin(th3)+0.6*cos(th3),...
        0.40*sin(th3)+0.45*cos(th3),...
        -0.25*sin(th3)+0.3*cos(th3),...
        0.05*sin(th3)+0.25*cos(th3),...
        0.05*sin(th3)];
        yres_32=y03+[0.05*cos(th3),0.05*cos(th3)+0.25*sin(th3),...
        0.40*cos(th3)+0.3*sin(th3),...
        -0.25*cos(th3)+0.45*sin(th3),...
        0.40*cos(th3)+0.6*sin(th3),...
        -0.250*cos(th3)+0.75*sin(th3),...
        0.40*cos(th3)+0.9*sin(th3),...
        0.05*cos(th3)+0.95*sin(th3),...
        0.05*cos(th3)+1.2*sin(th3),...
        -0.05*cos(th3)+1.2*sin(th3),...
        -0.05*cos(th3)+0.95*sin(th3),...
        0.25*cos(th3)+0.9*sin(th3),...
        -0.40*cos(th3)+0.75*sin(th3),...

```

```

    0.25*cos(th3)+0.6*sin(th3),...
    -0.40*cos(th3)+0.45*sin(th3),...
    0.25*cos(th3)+0.3*sin(th3),...
    -0.05*cos(th3)+0.25*sin(th3),...
    -0.05*cos(th3)];

    x04=9.0;
    y04=-2.5;

    xV_1=x04+[-1.0,1.0,1.0,-1.0];
    yV_1=y04+[-0.05,-0.05,0.05,0.05]+0.3;

    xV_2=x04+[-0.4,0.4,0.4,-0.4];
    yV_2=y04+[-0.1,-0.1,0.1,0.1]-0.1;

    x05=-4;
    y05=-3;

    x06=0;
    y06=5;

xV3_1=x06+[-0.032,0.032,0.032,-0.032]+0.1;
yV3_1=y06+[-1.5,-1.5,1.5,1.5];

xV3_2=x06+[-0.05,0.05,0.05,-0.05]-0.2;
yV3_2=y06+[-0.75,-0.75,0.75,0.75];

xcable1=[-9.5,-9.5,x06-0.25,x06-0.25];
ycable1=y06+[0.1,-0.1,-0.1,0.1];

xcable2=[-9.55,-9.45,-9.45,-9.55];
ycable2=[y01+1.6,y01+1.6,y06,y06];

xcable3=[-9.55,-9.45,-9.45,-9.55];
ycable3=[y01,y01,y04+0.35,y04+0.35];

xcable4=[-9.55,-9.45,-9.45,-9.55];
ycable4=[-7.0,-7.0,y04+0.35,y04+0.35];

xcable5=[-9.5,-9.5,9,9];
ycable5=-7.0+[0.1,-0.1,-0.1,0.1];

xcable6=[-9.55,-9.45,-9.45,-9.55]+5.5;
ycable6=[y01+1.6,y01+1.6,y06,y06];

xcable7=[-9.55,-9.45,-9.45,-9.55]+5.5;
ycable7=[y01,y01,y04+0.35,y04+0.35];

xcable8=[-9.55,-9.45,-9.45,-9.55]+5.5;
ycable8=[-7.0,-7.0,y04+0.35,y04+0.35];

xcable9=[x03,x03,x06+0.132,x06+0.132];
ycable9=y06+[0.1,-0.1,-0.1,0.1];

xcable10=[x03+1.2,x03+1.2,9,9];
ycable10=y06+[0.1,-0.1,-0.1,0.1];

xcable11=[9.05,8.95,8.95,9.05];
ycable11=[y04+0.35,y04+0.35,y06,y06];

xcable12=[9.05,8.95,8.95,9.05];
ycable12=[y04-0.2,y04-0.2,-7.0,-7.0];

xI_1=-9.5+[-0.05,0.05,0.05,0.25,0.0,-0.25,-0.05];
yI_1=2.5+[0.0,0.0,1.5,1.5,2.0,1.5,1.5];

xII_1=9.0+[-0.05,0.05,0.05,0.25,0.0,-0.25,-0.05];
yII_1=1.5+[0.0,0.0,1.5,1.5,2.0,1.5,1.5];

th1=0:-0.01:-pi;
th2=-pi:0.01:0;

xcirc1_1=-7.0+[1.0,1.1,1.1*cos(th1),-1.0,1.0*cos(th2)];
ycirc1_1=0.0+[0.0,0.0,1.1*sin(th1),0.0,1.0*sin(th2)];

xcirc1_2=-8.0+[0.5,0.0,-0.5];
ycirc1_2=[0.0,0.5,0.0];

```

```

xcirc2_1=3.0+[1.0,1.1,1.1*cos(th1),-1.0,1.0*cos(th2)];
ycirc2_1=0.0+[0.0,0.0,1.1*sin(th1),0.0,1.0*sin(th2)];

xcirc2_2=2.0+[0.5,0.0,-0.5];
ycirc2_2=[0.0,0.5,0.0];

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_11,yres_11,[1.0,1.0,1.0],...
xres_12,yres_12,[0.0,0.0,0.0],...
xres_21,yres_21,[1.0,1.0,1.0],...
xres_22,yres_22,[0.0,0.0,0.0],...
xres_31,yres_31,[1.0,1.0,1.0],...
xres_32,yres_32,[0.0,0.0,0.0],...
xV_1,yV_1,[0.0,0.0,0.0],...
xV_2,yV_2,[0.0,0.0,0.0],...
xV3_1,yV3_1,[0.0,0.0,0.0],...
xV3_2,yV3_2,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
xcable10,ycable10,[0.8,0.6,0.2],...
xcable11,ycable11,[0.8,0.6,0.2],...
xcable12,ycable12,[0.8,0.6,0.2],...
xI_1,yI_1,[0.0,0.0,0.0],...
xII_1,yII_1,[0.0,0.0,0.0],...
xcirc1_1,ycirc1_1,[0.0,0.0,0.0],...
xcirc1_2,ycirc1_2,[0.0,0.0,0.0],...
xcirc2_1,ycirc2_1,[0.0,0.0,0.0],...
xcirc2_2,ycirc2_2,[0.0,0.0,0.0],...
'Linestyle','None')

text(-11,11,'Από τις εξισώσεις των βρόχων έχουμε (I1)=J1), (I=-J2) τις παρακάτω εξισώσεις:')
text(-11,10,'J1(R1+R2)-J2R2=0, (b+R2)J1-(R2+R3)J2=V. Από αυτές θα έχουμε για
την αντίσταση Thevenin')
text(-11,9,'RT=(V/I)=(R1+R2)(R2+R3)-R2(b+R2)/(R1+R2)=')
text(-2.2,9.2,nRT)
text(-1.3,9.2,'Ohm')
text(-10.5,0.7,'R1','Color',[0.9,0.2,0.0])
text(-5.0,0.7,'R2','Color',[0.9,0.2,0.0])
text(3.5,6.5,'R3','Color',[0.9,0.2,0.0])
text(-10.5,3.5,'I1','Color',[0.7,0.0,0.7])
text(-0.5,6.5,'bI1','Color',[0.0,0.2,0.9])
text(9.5,y06,'A','Color',[0.9,0.0,0.0])
text(9.5,-7.0,'B','Color',[0.9,0.0,0.0])
text(8.5,2.5,'I','Color',[0.7,0.0,0.7])
text(8.5,-1.7,'V','Color',[0.0,0.0,0.9])
text(-7.0,0.0,'J1','Color',[0.9,0.0,0.0])
text(3.0,0.0,'J2','Color',[0.9,0.0,0.0])

axis([-12,12,-12,12])
axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
elseif (snmeio==3)
axes(handles.axes1);
cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,7,7];

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x01=-9.5;
y01=0;
th1=pi/2;

```

```

x02=-4;
y02=0;
th2=pi/2;

x03=3;
y03=5;
th3=0;

xres_31=x03+[0.40*sin(th3),0.40*sin(th3)+1.2*cos(th3),...
-0.40*sin(th3)+1.2*cos(th3),-0.40*sin(th3)];
yres_31=y03+[-0.40*cos(th3),-0.40*cos(th3)+1.2*sin(th3),...
0.40*cos(th3)+1.2*sin(th3),0.40*cos(th3)];

xres_32=x03+[-0.05*sin(th3),-0.05*sin(th3)+0.25*cos(th3),...
-0.40*sin(th3)+0.3*cos(th3),...
0.25*sin(th3)+0.45*cos(th3),...
-0.40*sin(th3)+0.6*cos(th3),...
0.25*sin(th3)+0.75*cos(th3),...
-0.40*sin(th3)+0.9*cos(th3),...
-0.05*sin(th3)+0.95*cos(th3),...
-0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+0.95*cos(th3),...
-0.25*sin(th3)+0.9*cos(th3),...
0.40*sin(th3)+0.75*cos(th3),...
-0.25*sin(th3)+0.6*cos(th3),...
0.40*sin(th3)+0.45*cos(th3),...
-0.25*sin(th3)+0.3*cos(th3),...
0.05*sin(th3)+0.25*cos(th3),...
0.05*sin(th3)];
yres_32=y03+[0.05*cos(th3),0.05*cos(th3)+0.25*sin(th3),...
0.40*cos(th3)+0.3*sin(th3),...
-0.25*cos(th3)+0.45*sin(th3),...
0.40*cos(th3)+0.6*sin(th3),...
-0.250*cos(th3)+0.75*sin(th3),...
0.40*cos(th3)+0.9*sin(th3),...
0.05*cos(th3)+0.95*sin(th3),...
0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+0.95*sin(th3),...
0.25*cos(th3)+0.9*sin(th3),...
-0.40*cos(th3)+0.75*sin(th3),...
0.25*cos(th3)+0.6*sin(th3),...
-0.40*cos(th3)+0.45*sin(th3),...
0.25*cos(th3)+0.3*sin(th3),...
-0.05*cos(th3)+0.25*sin(th3),...
-0.05*cos(th3)];

x04=-9.5;
y04=-3;

x05=-4;
y05=-3;

xv2_1=x05+[-1.0,1.0,1.0,-1.0];
yv2_1=y05+[-0.05,-0.05,0.05,0.05]+0.3;

xv2_2=x05+[-0.4,0.4,0.4,-0.4];
yv2_2=y05+[-0.1,-0.1,0.1,0.1]-0.1;

x06=0;
y06=5;

xcable5=[-4.0,-4.0,9,9];
ycable5=-7.0+[0.1,-0.1,-0.1,0.1];

xcable6=[-9.55,-9.45,-9.45,-9.55]+5.5;
ycable6=[y01,y01,y06,y06];

xcable7=[-9.55,-9.45,-9.45,-9.55]+5.5;
ycable7=[y01,y01,y04+0.35,y04+0.35];

xcable8=[-9.55,-9.45,-9.45,-9.55]+5.5;
ycable8=[-7.0,-7.0,y04-0.2,y04-0.2];

xcable9=[x03,x03,-4.0,-4.0];
ycable9=y06+[0.1,-0.1,-0.1,0.1];

xcable10=[x03+1.2,x03+1.2,9,9];
ycable10=y06+[0.1,-0.1,-0.1,0.1];

```



```

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_31,yres_31,[1.0,1.0,1.0],...
xres_32,yres_32,[0.0,0.0,0.0],...
xV2_1,yV2_1,[0.0,0.0,0.0],...
xV2_2,yV2_2,[0.0,0.0,0.0],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
xcable10,ycable10,[0.8,0.6,0.2],...
'LineStyle','None')

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

text(-11,11,'Για τον υπολογισμό της τάσης Thevenin V_{T}, από το αρχικό κύκλωμα έχουμε')
text(-11,10,'V_{AB}=V_{T}=bI_{1}+R_{2}I_{1}+aV_{1}. Από τον βρόχο έχουμε V_{1}-I_{1}R_{1}-I_{1}R_{2}-aV_{1}=0.')
text(-11,9,'Επιλύοντας ως προς I_{1} και αντικαθιστώντας στην παραπάνω σχέση έχουμε')
text(-11,8,'V_{T}=V_{1}((b+R_{2})(1-a)+a(R_{1}+R_{2}))/(R_{1}+R_{2})=')
text(-3.5,8.2,nVT)
text(-2.5,8.2,'Volt')
text(9.5,y06,'A','Color',[0.9,0.0,0.0])
text(9.5,-7.0,'B','Color',[0.9,0.0,0.0])
text(3.5,6.5,'R_T','Color',[0.9,0.2,0.0])
text(-5.0,-2.0,'V_T','Color',[0.0,0.2,0.9])

axis([-12,12,-12,12])
axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

else
end

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

% --- Executes on button press in pushbutton4.
function pushbutton4_Callback(hObject, eventdata, handles)
% hObject handle to pushbutton4 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)
hfin=questdlg('Έξοδος από το πρόγραμμα?');
switch hfin
case 'Yes'
closereq;
end

```

Ασκηση 4

```

function varargout = g_asknsn_4(varargin)
% G_ASKNSN_4 M-file for g_asknsn_4.fig
% G_ASKNSN_4, by itself, creates a new G_ASKNSN_4 or raises the existing
% singleton*.
%
% H = G_ASKNSN_4 returns the handle to a new G_ASKNSN_4 or the handle to
% the existing singleton*.
%
% G_ASKNSN_4('CALLBACK',hObject,eventData,handles,...) calls the local
% function named CALLBACK in G_ASKNSN_4.M with the given input arguments.
%
% G_ASKNSN_4('Property','Value',...) creates a new G_ASKNSN_4 or raises the
% existing singleton*. Starting from the left, property value pairs are
% applied to the GUI before g_asknsn_4_OpeningFcn gets called. An
% unrecognized property name or invalid value makes property application
% stop. All inputs are passed to g_asknsn_4_OpeningFcn via varargin.
%
% *See GUI Options on GUIDE's Tools menu. Choose "GUI allows only one
% instance to run (singleton)".
%

```



```

-0.40*cos(th1)+0.45*sin(th1),...
0.25*cos(th1)+0.3*sin(th1),...
-0.05*cos(th1)+0.25*sin(th1),...
-0.05*cos(th1)];

x02=-8.0;
y02=5;
th2=0;

xres_21=x02+[0.40*sin(th2),0.40*sin(th2)+1.2*cos(th2),...
-0.40*sin(th2)+1.2*cos(th2),-0.40*sin(th2)];
yres_21=y02+[-0.40*cos(th2),-0.40*cos(th2)+1.2*sin(th2),...
0.40*cos(th2)+1.2*sin(th2),0.40*cos(th2)];

xres_22=x02+[-0.05*sin(th2),-0.05*sin(th2)+0.25*cos(th2),...
-0.40*sin(th2)+0.3*cos(th2),...
0.25*sin(th2)+0.45*cos(th2),...
-0.40*sin(th2)+0.6*cos(th2),...
0.25*sin(th2)+0.75*cos(th2),...
-0.40*sin(th2)+0.9*cos(th2),...
-0.05*sin(th2)+0.95*cos(th2),...
-0.05*sin(th2)+1.2*cos(th2),...
0.05*sin(th2)+1.2*cos(th2),...
0.05*sin(th2)+0.95*cos(th2),...
-0.25*sin(th2)+0.9*cos(th2),...
0.40*sin(th2)+0.75*cos(th2),...
-0.25*sin(th2)+0.6*cos(th2),...
0.40*sin(th2)+0.45*cos(th2),...
-0.25*sin(th2)+0.3*cos(th2),...
0.05*sin(th2)+0.25*cos(th2),...
0.05*sin(th2)];
yres_22=y02+[0.05*cos(th2),0.05*cos(th2)+0.25*sin(th2),...
0.40*cos(th2)+0.3*sin(th2),...
-0.25*cos(th2)+0.45*sin(th2),...
0.40*cos(th2)+0.6*sin(th2),...
-0.250*cos(th2)+0.75*sin(th2),...
0.40*cos(th2)+0.9*sin(th2),...
0.05*cos(th2)+0.95*sin(th2),...
0.05*cos(th2)+1.2*sin(th2),...
-0.05*cos(th2)+1.2*sin(th2),...
-0.05*cos(th2)+0.95*sin(th2),...
0.25*cos(th2)+0.9*sin(th2),...
-0.40*cos(th2)+0.75*sin(th2),...
0.25*cos(th2)+0.6*sin(th2),...
-0.40*cos(th2)+0.45*sin(th2),...
0.25*cos(th2)+0.3*sin(th2),...
-0.05*cos(th2)+0.25*sin(th2),...
-0.05*cos(th2)];

x03=-3.0;
y03=2.5;
th3=pi/2;

xres_31=x03+[0.25*sin(th3),0.25*sin(th3)+1.6*cos(th3),...
-0.25*sin(th3)+1.6*cos(th3),-0.25*sin(th3)];
yres_31=y03+[-0.25*cos(th3),-0.25*cos(th3)+1.6*sin(th3),...
0.25*cos(th3)+1.6*sin(th3),0.25*cos(th3)];

xres_32=x03+[-0.03*sin(th3),-0.03*sin(th3)+0.33*cos(th3),...
-0.25*sin(th3)+0.4*cos(th3),...
0.10*sin(th3)+0.6*cos(th3),...
-0.25*sin(th3)+0.8*cos(th3),...
0.10*sin(th3)+1.0*cos(th3),...
-0.25*sin(th3)+1.2*cos(th3),...
-0.03*sin(th3)+1.27*cos(th3),...
-0.03*sin(th3)+1.6*cos(th3),...
0.03*sin(th3)+1.6*cos(th3),...
0.03*sin(th3)+1.27*cos(th3),...
-0.10*sin(th3)+1.2*cos(th3),...
0.25*sin(th3)+1.0*cos(th3),...
-0.10*sin(th3)+0.8*cos(th3),...
0.25*sin(th3)+0.6*cos(th3),...
-0.10*sin(th3)+0.4*cos(th3),...
0.03*sin(th3)+0.33*cos(th3),...
0.03*sin(th3)];
yres_32=y03+[0.03*cos(th3),0.03*cos(th3)+0.33*sin(th3),...
0.25*cos(th3)+0.4*sin(th3),...
-0.10*cos(th3)+0.6*sin(th3),...
0.25*cos(th3)+0.8*sin(th3),...
-0.10*cos(th3)+1.0*sin(th3),...
0.25*cos(th3)+1.2*sin(th3),...

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0.03*cos(th3)+1.27*sin(th3),...
0.03*cos(th3)+1.6*sin(th3),...
-0.03*cos(th3)+1.6*sin(th3),...
-0.03*cos(th3)+1.27*sin(th3),...
0.10*cos(th3)+1.2*sin(th3),...
-0.25*cos(th3)+1.0*sin(th3),...
0.10*cos(th3)+0.8*sin(th3),...
-0.25*cos(th3)+0.6*sin(th3),...
0.10*cos(th3)+0.4*sin(th3),...
-0.03*cos(th3)+0.33*sin(th3),...
-0.03*cos(th3)];

x04=-3.0;
y04=-2.5;
th4=pi/2;

xres_41=x04+[0.25*sin(th4),0.25*sin(th4)+1.6*cos(th4),...
-0.25*sin(th4)+1.6*cos(th4),-0.25*sin(th4)];
yres_41=y04+[-0.25*cos(th4),-0.25*cos(th4)+1.6*sin(th4),...
0.25*cos(th4)+1.6*sin(th4),0.25*cos(th4)];

xres_42=x04+[-0.03*sin(th4),-0.03*sin(th4)+0.33*cos(th4),...
-0.25*sin(th4)+0.4*cos(th4),...
0.10*sin(th4)+0.6*cos(th4),...
-0.25*sin(th4)+0.8*cos(th4),...
0.10*sin(th4)+1.0*cos(th4),...
-0.25*sin(th4)+1.2*cos(th4),...
-0.03*sin(th4)+1.27*cos(th4),...
-0.03*sin(th4)+1.6*cos(th4),...
0.03*sin(th4)+1.6*cos(th4),...
0.03*sin(th4)+1.27*cos(th4),...
-0.10*sin(th4)+1.2*cos(th4),...
0.25*sin(th4)+1.0*cos(th4),...
-0.10*sin(th4)+0.8*cos(th4),...
0.25*sin(th4)+0.6*cos(th4),...
-0.10*sin(th4)+0.4*cos(th4),...
0.03*sin(th4)+0.33*cos(th4),...
0.03*sin(th4)];
yres_42=y04+[0.03*cos(th4),0.03*cos(th4)+0.33*sin(th4),...
0.25*cos(th4)+0.4*sin(th4),...
-0.10*cos(th4)+0.6*sin(th4),...
0.25*cos(th4)+0.8*sin(th4),...
-0.10*cos(th4)+1.0*sin(th4),...
0.25*cos(th4)+1.2*sin(th4),...
0.03*cos(th4)+1.27*sin(th4),...
0.03*cos(th4)+1.6*sin(th4),...
-0.03*cos(th4)+1.6*sin(th4),...
-0.03*cos(th4)+1.27*sin(th4),...
0.10*cos(th4)+1.2*sin(th4),...
-0.25*cos(th4)+1.0*sin(th4),...
0.10*cos(th4)+0.8*sin(th4),...
-0.25*cos(th4)+0.6*sin(th4),...
0.10*cos(th4)+0.4*sin(th4),...
-0.03*cos(th4)+0.33*sin(th4),...
-0.03*cos(th4)];

x05=1.0;
y05=0.5;
th5=0;

xres_51=x05+[0.40*sin(th5),0.40*sin(th5)+1.2*cos(th5),...
-0.40*sin(th5)+1.2*cos(th5),-0.40*sin(th5)];
yres_51=y05+[-0.40*cos(th5),-0.40*cos(th5)+1.2*sin(th5),...
0.40*cos(th5)+1.2*sin(th5),0.40*cos(th5)];

xres_52=x05+[-0.05*sin(th5),-0.05*sin(th5)+0.25*cos(th5),...
-0.40*sin(th5)+0.3*cos(th5),...
0.25*sin(th5)+0.45*cos(th5),...
-0.40*sin(th5)+0.6*cos(th5),...
0.25*sin(th5)+0.75*cos(th5),...
-0.40*sin(th5)+0.9*cos(th5),...
-0.05*sin(th5)+0.95*cos(th5),...
-0.05*sin(th5)+1.2*cos(th5),...
0.05*sin(th5)+1.2*cos(th5),...
0.05*sin(th5)+0.95*cos(th5),...
-0.25*sin(th5)+0.9*cos(th5),...
0.40*sin(th5)+0.75*cos(th5),...
-0.25*sin(th5)+0.6*cos(th5),...
0.40*sin(th5)+0.45*cos(th5),...
-0.25*sin(th5)+0.3*cos(th5),...

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```

0.05*sin(th5)+0.25*cos(th5),...
0.05*sin(th5)];
yres_52=y05+[0.05*cos(th5),0.05*cos(th5)+0.25*sin(th5),...
0.40*cos(th5)+0.3*sin(th5),...
-0.25*cos(th5)+0.45*sin(th5),...
0.40*cos(th5)+0.6*sin(th5),...
-0.250*cos(th5)+0.75*sin(th5),...
0.40*cos(th5)+0.9*sin(th5),...
0.05*cos(th5)+0.95*sin(th5),...
0.05*cos(th5)+1.2*sin(th5),...
-0.05*cos(th5)+1.2*sin(th5),...
-0.05*cos(th5)+0.95*sin(th5),...
0.25*cos(th5)+0.9*sin(th5),...
-0.40*cos(th5)+0.75*sin(th5),...
0.25*cos(th5)+0.6*sin(th5),...
-0.40*cos(th5)+0.45*sin(th5),...
0.25*cos(th5)+0.3*sin(th5),...
-0.05*cos(th5)+0.25*sin(th5),...
-0.05*cos(th5)];

x06=6.0;
y06=-2.5;
th6=pi/2;

xres_61=x06+[0.25*sin(th6),0.25*sin(th6)+1.6*cos(th6),...
-0.25*sin(th6)+1.6*cos(th6),-0.25*sin(th6)];
yres_61=y06+[-0.25*cos(th6),-0.25*cos(th6)+1.6*sin(th6),...
0.25*cos(th6)+1.6*sin(th6),0.25*cos(th6)];

xres_62=x06+[-0.03*sin(th6),-0.03*sin(th6)+0.33*cos(th6),...
-0.25*sin(th6)+0.4*cos(th6),...
0.10*sin(th6)+0.6*cos(th6),...
-0.25*sin(th6)+0.8*cos(th6),...
0.10*sin(th6)+1.0*cos(th6),...
-0.25*sin(th6)+1.2*cos(th6),...
-0.03*sin(th6)+1.27*cos(th6),...
-0.03*sin(th6)+1.6*cos(th6),...
0.03*sin(th6)+1.6*cos(th6),...
0.03*sin(th6)+1.27*cos(th6),...
-0.10*sin(th6)+1.2*cos(th6),...
0.25*sin(th6)+1.0*cos(th6),...
-0.10*sin(th6)+0.8*cos(th6),...
0.25*sin(th6)+0.6*cos(th6),...
-0.10*sin(th6)+0.4*cos(th6),...
0.03*sin(th6)+0.33*cos(th6),...
0.03*sin(th6)];
yres_62=y06+[0.03*cos(th6),0.03*cos(th6)+0.33*sin(th6),...
0.25*cos(th6)+0.4*sin(th6),...
-0.10*cos(th6)+0.6*sin(th6),...
0.25*cos(th6)+0.8*sin(th6),...
-0.10*cos(th6)+1.0*sin(th6),...
0.25*cos(th6)+1.2*sin(th6),...
0.03*cos(th6)+1.27*sin(th6),...
0.03*cos(th6)+1.6*sin(th6),...
-0.03*cos(th6)+1.6*sin(th6),...
-0.03*cos(th6)+1.27*sin(th6),...
0.10*cos(th6)+1.2*sin(th6),...
-0.25*cos(th6)+1.0*sin(th6),...
0.10*cos(th6)+0.8*sin(th6),...
-0.25*cos(th6)+0.6*sin(th6),...
0.10*cos(th6)+0.4*sin(th6),...
-0.03*cos(th6)+0.33*sin(th6),...
-0.03*cos(th6)];

x07=-9.5;
y07=0;

xv1_1=x07+[-1.0,1.0,1.0,-1.0];
yv1_1=y07+[-0.05,-0.05,0.05,0.05]+0.3;

xv1_2=x07+[-0.4,0.4,0.4,-0.4];
yv1_2=y07+[-0.1,-0.1,0.1,0.1]-0.1;

x08=6.0;
y08=2.5;
phi8=0:0.01:2*pi;

xI1_1=x08+0.6*cos(phi8);
yI1_1=y08+0.9*sin(phi8);

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```

xI1_2=x08+0.55*cos(phi8);
yI1_2=y08+0.85*sin(phi8);
xI1_3=x08+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI1_3=y08+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

x09=-6.0;
y09=0.5;
phi9=0:0.01:2*pi;

xI2_1=x09+0.6*cos(phi9);
yI2_1=y09+0.9*sin(phi9);

xI2_2=x09+0.55*cos(phi9);
yI2_2=y09+0.85*sin(phi9);
xI2_3=x09+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI2_3=y09+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

xcable1=[-9.5,-9.5,-8,-8];
ycable1=y02+[0.1,-0.1,-0.1,0.1];

xcable2=[-9.55,-9.45,-9.45,-9.55];
ycable2=[y02+0.1,y02+0.1,y07+0.35,y07+0.35];

xcable3=[-9.55,-9.45,-9.45,-9.55];
ycable3=[y01,y01,y07-0.2,y07-0.2];

xcable4=[-9.5,-9.5,x01,x01];
ycable4=y01+[0.1,-0.1,-0.1,0.1];

xcable5=[9.5,9.5,x01+1.2,x01+1.2];
ycable5=y01+[0.1,-0.1,-0.1,0.1];

xcable6=[9.5,9.5,x02+1.2,x02+1.2];
ycable6=y02+[0.1,-0.1,-0.1,0.1];

xcable7=[-9.55,-9.45,-9.45,-9.55]+6.5;
ycable7=[y02,y02,y03+1.6,y03+1.6];

xcable8=[-9.55,-9.45,-9.45,-9.55]+6.5;
ycable8=[y04+1.6,y04+1.6,y03,y03];

xcable9=[-9.55,-9.45,-9.45,-9.55]+6.5;
ycable9=[y04,y04,y01,y01];

xcable10=[-3.0,-3.0,x05,x05];
ycable10=y05+[0.1,-0.1,-0.1,0.1];

xcable11=[x06,x06,x05+1.2,x05+1.2];
ycable11=y05+[0.1,-0.1,-0.1,0.1];

xcable12=[-9.55,-9.45,-9.45,-9.55]+15.5;
ycable12=[y02,y02,y08+0.9,y08+0.9];

xcable13=[-9.55,-9.45,-9.45,-9.55]+15.5;
ycable13=[y06+1.6,y06+1.6,y08-0.9,y08-0.9];

xcable14=[-9.55,-9.45,-9.45,-9.55]+15.5;
ycable14=[y06,y06,y01,y01];

xcable15=[-9.5,-9.5,x09,x09];
ycable15=y02+[0.1,-0.1,-0.1,0.1]-2.0;

xcable16=[-9.55,-9.45,-9.45,-9.55]+3.5;
ycable16=[y02-1.9,y02-1.9,y09+0.9,y09+0.9];

xcable17=[-9.55,-9.45,-9.45,-9.55]+3.5;
ycable17=[y01,y01,y09-0.9,y09-0.9];

xI_1=x02+2.5+[0.0,0.0,1.0,1.0,1.5,1.0,1.0];
yI_1=y02+[0.1,-0.1,-0.1,-0.3,0.0,0.3,0.1];

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_11,yres_11,[1.0,1.0,1.0],...
xres_12,yres_12,[0.0,0.0,0.0],...

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xres_21,yres_21,[1.0,1.0,1.0],...
xres_22,yres_22,[0.0,0.0,0.0],...
xres_31,yres_31,[1.0,1.0,1.0],...
xres_32,yres_32,[0.0,0.0,0.0],...
xres_41,yres_41,[1.0,1.0,1.0],...
xres_42,yres_42,[0.0,0.0,0.0],...
xres_51,yres_51,[1.0,1.0,1.0],...
xres_52,yres_52,[0.0,0.0,0.0],...
xres_61,yres_61,[1.0,1.0,1.0],...
xres_62,yres_62,[0.0,0.0,0.0],...
xV1_1,yV1_1,[0.0,0.0,0.0],...
xV1_2,yV1_2,[0.0,0.0,0.0],...
xI1_1,yI1_1,[0.0,0.0,0.0],...
xI1_2,yI1_2,[1.0,1.0,1.0],...
xI1_3,yI1_3,[0.0,0.0,0.0],...
xI2_1,yI2_1,[0.0,0.0,0.0],...
xI2_2,yI2_2,[1.0,1.0,1.0],...
xI2_3,yI2_3,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
xcable10,ycable10,[0.8,0.6,0.2],...
xcable11,ycable11,[0.8,0.6,0.2],...
xcable12,ycable12,[0.8,0.6,0.2],...
xcable13,ycable13,[0.8,0.6,0.2],...
xcable14,ycable14,[0.8,0.6,0.2],...
xcable15,ycable15,[0.8,0.6,0.2],...
xcable16,ycable16,[0.8,0.6,0.2],...
xcable17,ycable17,[0.8,0.6,0.2],...
xI_1,yI_1,[0.0,0.0,0.0],...
'Linestyle','None')

text(-11,11,'Να υπολογιστεί το ισοδύναμο Thevenin του παρακάτω κυκλώματος απο τα άκρα a, b')
text(9.7,y02,'a','Color',[0.9,0.0,0.0])
text(9.7,y01,'b','Color',[0.9,0.0,0.0])
text(x01+0.5,y01-1.5,'R_1','Color',[0.9,0.2,0.0])
text(x02+0.5,y02+1.5,'R_2','Color',[0.9,0.2,0.0])
text(x03+0.5,y03+0.75,'R_3','Color',[0.9,0.2,0.0])
text(x04+0.5,y04+0.75,'R_4','Color',[0.9,0.2,0.0])
text(x05+0.5,y05-1.5,'R_5','Color',[0.9,0.2,0.0])
text(x06+0.5,y06+0.75,'R_6','Color',[0.9,0.2,0.0])
text(x07-0.75,y07+1.0,'V_1','Color',[0.0,0.2,0.9])
text(x09+0.85,y09,'J_1','Color',[0.0,0.2,0.9])
text(x08+0.85,y08,'2F_1','Color',[0.0,0.2,0.9])
text(x02+3.0,y02-1.0,'I_1','Color',[0.0,0.2,0.9])
text(-9.7,y02+1.0,'c','Color',[0.9,0.0,0.0])
text(x04,y01-1.0,'d','Color',[0.9,0.0,0.0])

axis([-12,12,-12,12])
axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

% Choose default command line output for g_asknsn_4
handles.output = hObject;

% Update handles structure
guidata(hObject, handles);

% UIWAIT makes g_asknsn_4 wait for user response (see UIRESUME)
% uiwait(handles.figure1);

% --- Outputs from this function are returned to the command line.
function varargout = g_asknsn_4_OutputFcn(hObject, eventdata, handles)
% varargout cell array for returning output args (see VARARGOUT);
% hObject handle to figure
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

% Get default command line output from handles structure
varargout{1} = handles.output;

```

```

        function edit1_Callback(hObject, eventdata, handles)
            % hObject      handle to edit1 (see GCBO)
            % eventdata  reserved - to be defined in a future version of MATLAB
            % handles     structure with handles and user data (see GUIDATA)

            % Hints: get(hObject,'String') returns contents of edit1 as text
            % str2double(get(hObject,'String')) returns contents of edit1 as a double

            % --- Executes during object creation, after setting all properties.
            function edit1_CreateFcn(hObject, eventdata, handles)
                % hObject      handle to edit1 (see GCBO)
                % eventdata  reserved - to be defined in a future version of MATLAB
                % handles     empty - handles not created until after all CreateFcns called

                % Hint: edit controls usually have a white background on Windows.
                %         See ISPC and COMPUTER.
            if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUiControlBackgroundColor'))
                set(hObject,'BackgroundColor','white');
            end

        function edit2_Callback(hObject, eventdata, handles)
            % hObject      handle to edit2 (see GCBO)
            % eventdata  reserved - to be defined in a future version of MATLAB
            % handles     structure with handles and user data (see GUIDATA)

            % Hints: get(hObject,'String') returns contents of edit2 as text
            % str2double(get(hObject,'String')) returns contents of edit2 as a double

            % --- Executes during object creation, after setting all properties.
            function edit2_CreateFcn(hObject, eventdata, handles)
                % hObject      handle to edit2 (see GCBO)
                % eventdata  reserved - to be defined in a future version of MATLAB
                % handles     empty - handles not created until after all CreateFcns called

                % Hint: edit controls usually have a white background on Windows.
                %         See ISPC and COMPUTER.
            if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUiControlBackgroundColor'))
                set(hObject,'BackgroundColor','white');
            end

        function edit3_Callback(hObject, eventdata, handles)
            % hObject      handle to edit3 (see GCBO)
            % eventdata  reserved - to be defined in a future version of MATLAB
            % handles     structure with handles and user data (see GUIDATA)

            % Hints: get(hObject,'String') returns contents of edit3 as text
            % str2double(get(hObject,'String')) returns contents of edit3 as a double

            % --- Executes during object creation, after setting all properties.
            function edit3_CreateFcn(hObject, eventdata, handles)
                % hObject      handle to edit3 (see GCBO)
                % eventdata  reserved - to be defined in a future version of MATLAB
                % handles     empty - handles not created until after all CreateFcns called

                % Hint: edit controls usually have a white background on Windows.
                %         See ISPC and COMPUTER.
            if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUiControlBackgroundColor'))
                set(hObject,'BackgroundColor','white');
            end

        function edit4_Callback(hObject, eventdata, handles)
            % hObject      handle to edit4 (see GCBO)
            % eventdata  reserved - to be defined in a future version of MATLAB
            % handles     structure with handles and user data (see GUIDATA)

            % Hints: get(hObject,'String') returns contents of edit4 as text
            % str2double(get(hObject,'String')) returns contents of edit4 as a double

            % --- Executes during object creation, after setting all properties.
            function edit4_CreateFcn(hObject, eventdata, handles)

```



```

        % hObject    handle to edit4 (see GCBO)
        % eventdata reserved - to be defined in a future version of MATLAB
        % handles    empty - handles not created until after all CreateFcns called

        % Hint: edit controls usually have a white background on Windows.
        %           See ISPC and COMPUTER.
    if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
        set(hObject,'BackgroundColor','white');
    end

    function edit5_Callback(hObject, eventdata, handles)
        % hObject    handle to edit5 (see GCBO)
        % eventdata reserved - to be defined in a future version of MATLAB
        % handles    structure with handles and user data (see GUIDATA)

        % Hints: get(hObject,'String') returns contents of edit5 as text
        %           str2double(get(hObject,'String')) returns contents of edit5 as a double

        % --- Executes during object creation, after setting all properties.
        function edit5_CreateFcn(hObject, eventdata, handles)
            % hObject    handle to edit5 (see GCBO)
            % eventdata reserved - to be defined in a future version of MATLAB
            % handles    empty - handles not created until after all CreateFcns called

            % Hint: edit controls usually have a white background on Windows.
            %           See ISPC and COMPUTER.
    if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
        set(hObject,'BackgroundColor','white');
    end

    function edit6_Callback(hObject, eventdata, handles)
        % hObject    handle to edit6 (see GCBO)
        % eventdata reserved - to be defined in a future version of MATLAB
        % handles    structure with handles and user data (see GUIDATA)

        % Hints: get(hObject,'String') returns contents of edit6 as text
        %           str2double(get(hObject,'String')) returns contents of edit6 as a double

        % --- Executes during object creation, after setting all properties.
        function edit6_CreateFcn(hObject, eventdata, handles)
            % hObject    handle to edit6 (see GCBO)
            % eventdata reserved - to be defined in a future version of MATLAB
            % handles    empty - handles not created until after all CreateFcns called

            % Hint: edit controls usually have a white background on Windows.
            %           See ISPC and COMPUTER.
    if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
        set(hObject,'BackgroundColor','white');
    end

    function edit7_Callback(hObject, eventdata, handles)
        % hObject    handle to edit7 (see GCBO)
        % eventdata reserved - to be defined in a future version of MATLAB
        % handles    structure with handles and user data (see GUIDATA)

        % Hints: get(hObject,'String') returns contents of edit7 as text
        %           str2double(get(hObject,'String')) returns contents of edit7 as a double

        % --- Executes during object creation, after setting all properties.
        function edit7_CreateFcn(hObject, eventdata, handles)
            % hObject    handle to edit7 (see GCBO)
            % eventdata reserved - to be defined in a future version of MATLAB
            % handles    empty - handles not created until after all CreateFcns called

            % Hint: edit controls usually have a white background on Windows.
            %           See ISPC and COMPUTER.
    if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
        set(hObject,'BackgroundColor','white');
    end
end

```

```

function edit8_Callback(hObject, eventdata, handles)
% hObject      handle to edit8 (see GCBO)
% eventdata    reserved - to be defined in a future version of MATLAB
% handles      structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit8 as text
% str2double(get(hObject,'String')) returns contents of edit8 as a double

% --- Executes during object creation, after setting all properties.
function edit8_CreateFcn(hObject, eventdata, handles)
% hObject      handle to edit8 (see GCBO)
% eventdata    reserved - to be defined in a future version of MATLAB
% handles      empty - handles not created until after all CreateFcns called

% Hint: edit controls usually have a white background on Windows.
%       See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

% --- Executes on button press in pushbutton1.
function pushbutton1_Callback(hObject, eventdata, handles)
% hObject      handle to pushbutton1 (see GCBO)
% eventdata    reserved - to be defined in a future version of MATLAB
% handles      structure with handles and user data (see GUIDATA)

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

global R1;
global R2;
global R3;
global R4;
global R5;
global R6;
global V1;
global J1;

R1=str2double(get(handles.edit1,'String'));
R2=str2double(get(handles.edit2,'String'));
R3=str2double(get(handles.edit3,'String'));
R4=str2double(get(handles.edit4,'String'));
R5=str2double(get(handles.edit5,'String'));
R6=str2double(get(handles.edit6,'String'));
V1=str2double(get(handles.edit7,'String'));
J1=str2double(get(handles.edit8,'String'));

if (R1>10|R1<1)
h=warndlg('Βάλτε στην αντίσταση R1 τιμή μεταξύ 1 και 10');
return
end

if (R2>10|R2<1)
h=warndlg('Βάλτε στην αντίσταση R2 τιμή μεταξύ 1 και 10');
return
end

if (R3>10|R3<1)
h=warndlg('Βάλτε στην αντίσταση R3 τιμή μεταξύ 1 και 10');
return
end

if (R4>10|R4<1)
h=warndlg('Βάλτε στην αντίσταση R4 τιμή μεταξύ 1 και 10');
return
end

if (R5>10|R5<1)
h=warndlg('Βάλτε στην αντίσταση R5 τιμή μεταξύ 1 και 10');
return
end

if (R6>10|R6<1)
h=warndlg('Βάλτε στην αντίσταση R6 τιμή μεταξύ 1 και 10');
return
end

if (V1>15|V1<5)
h=warndlg('Βάλτε στην τάση V1 τιμή μεταξύ 5 και 15');
return
end

```

```

end

if (J1>5|J1<1)
h=warndlg('Βάλτε στο ρεύμα J1 τιμή μεταξύ 1 και 5');
return
end

axes(handles.axes1)
axis off;
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
global snmeio;
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
snmeio=1;
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,9,9];

x01=-8.0;
y01=-5;
th1=0;

xres_11=x01+[0.40*sin(th1),0.40*sin(th1)+1.2*cos(th1),...
-0.40*sin(th1)+1.2*cos(th1),-0.40*sin(th1)];
yres_11=y01+[-0.40*cos(th1),-0.40*cos(th1)+1.2*sin(th1),...
0.40*cos(th1)+1.2*sin(th1),0.40*cos(th1)];

xres_12=x01+[-0.05*sin(th1),-0.05*sin(th1)+0.25*cos(th1),...
-0.40*sin(th1)+0.3*cos(th1),...
0.25*sin(th1)+0.45*cos(th1),...
-0.40*sin(th1)+0.6*cos(th1),...
0.25*sin(th1)+0.75*cos(th1),...
-0.40*sin(th1)+0.9*cos(th1),...
-0.05*sin(th1)+0.95*cos(th1),...
-0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+0.95*cos(th1),...
-0.25*sin(th1)+0.9*cos(th1),...
0.40*sin(th1)+0.75*cos(th1),...
-0.25*sin(th1)+0.6*cos(th1),...
0.40*sin(th1)+0.45*cos(th1),...
-0.25*sin(th1)+0.3*cos(th1),...
0.05*sin(th1)+0.25*cos(th1),...
0.05*sin(th1)];
yres_12=y01+[0.05*cos(th1),0.05*cos(th1)+0.25*sin(th1),...
0.40*cos(th1)+0.3*sin(th1),...
-0.25*cos(th1)+0.45*sin(th1),...
0.40*cos(th1)+0.6*sin(th1),...
-0.250*cos(th1)+0.75*sin(th1),...
0.40*cos(th1)+0.9*sin(th1),...
0.05*cos(th1)+0.95*sin(th1),...
0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+0.95*sin(th1),...
0.25*cos(th1)+0.9*sin(th1),...
-0.40*cos(th1)+0.75*sin(th1),...
0.25*cos(th1)+0.6*sin(th1),...
-0.40*cos(th1)+0.45*sin(th1),...
0.25*cos(th1)+0.3*sin(th1),...
-0.05*cos(th1)+0.25*sin(th1),...
-0.05*cos(th1)];

x02=-8.0;
y02=5;
th2=0;

xres_21=x02+[0.40*sin(th2),0.40*sin(th2)+1.2*cos(th2),...
-0.40*sin(th2)+1.2*cos(th2),-0.40*sin(th2)];
yres_21=y02+[-0.40*cos(th2),-0.40*cos(th2)+1.2*sin(th2),...
0.40*cos(th2)+1.2*sin(th2),0.40*cos(th2)];

xres_22=x02+[-0.05*sin(th2),-0.05*sin(th2)+0.25*cos(th2),...
-0.40*sin(th2)+0.3*cos(th2),...
0.25*sin(th2)+0.45*cos(th2),...
-0.40*sin(th2)+0.6*cos(th2),...
0.25*sin(th2)+0.75*cos(th2),...
-0.40*sin(th2)+0.9*cos(th2),...

```

```

-0.05*sin(th2)+0.95*cos(th2),...
-0.05*sin(th2)+1.2*cos(th2),...
0.05*sin(th2)+1.2*cos(th2),...
0.05*sin(th2)+0.95*cos(th2),...
-0.25*sin(th2)+0.9*cos(th2),...
0.40*sin(th2)+0.75*cos(th2),...
-0.25*sin(th2)+0.6*cos(th2),...
0.40*sin(th2)+0.45*cos(th2),...
-0.25*sin(th2)+0.3*cos(th2),...
0.05*sin(th2)+0.25*cos(th2),...
0.05*sin(th2)];
yres_22=y02+[0.05*cos(th2),0.05*cos(th2)+0.25*sin(th2),...
0.40*cos(th2)+0.3*sin(th2),...
-0.25*cos(th2)+0.45*sin(th2),...
0.40*cos(th2)+0.6*sin(th2),...
-0.250*cos(th2)+0.75*sin(th2),...
0.40*cos(th2)+0.9*sin(th2),...
0.05*cos(th2)+0.95*sin(th2),...
0.05*cos(th2)+1.2*sin(th2),...
-0.05*cos(th2)+1.2*sin(th2),...
-0.05*cos(th2)+0.95*sin(th2),...
0.25*cos(th2)+0.9*sin(th2),...
-0.40*cos(th2)+0.75*sin(th2),...
0.25*cos(th2)+0.6*sin(th2),...
-0.40*cos(th2)+0.45*sin(th2),...
0.25*cos(th2)+0.3*sin(th2),...
-0.05*cos(th2)+0.25*sin(th2),...
-0.05*cos(th2)];

x03=-3.0;
y03=2.5;
th3=pi/2;

xres_31=x03+[0.25*sin(th3),0.25*sin(th3)+1.6*cos(th3),...
-0.25*sin(th3)+1.6*cos(th3),-0.25*sin(th3)];
yres_31=y03+[-0.25*cos(th3),-0.25*cos(th3)+1.6*sin(th3),...
0.25*cos(th3)+1.6*sin(th3),0.25*cos(th3)];

xres_32=x03+[-0.03*sin(th3),-0.03*sin(th3)+0.33*cos(th3),...
-0.25*sin(th3)+0.4*cos(th3),...
0.10*sin(th3)+0.6*cos(th3),...
-0.25*sin(th3)+0.8*cos(th3),...
0.10*sin(th3)+1.0*cos(th3),...
-0.25*sin(th3)+1.2*cos(th3),...
-0.03*sin(th3)+1.27*cos(th3),...
-0.03*sin(th3)+1.6*cos(th3),...
0.03*sin(th3)+1.6*cos(th3),...
0.03*sin(th3)+1.27*cos(th3),...
-0.10*sin(th3)+1.2*cos(th3),...
0.25*sin(th3)+1.0*cos(th3),...
-0.10*sin(th3)+0.8*cos(th3),...
0.25*sin(th3)+0.6*cos(th3),...
-0.10*sin(th3)+0.4*cos(th3),...
0.03*sin(th3)+0.33*cos(th3),...
0.03*sin(th3)];
yres_32=y03+[0.03*cos(th3),0.03*cos(th3)+0.33*sin(th3),...
0.25*cos(th3)+0.4*sin(th3),...
-0.10*cos(th3)+0.6*sin(th3),...
0.25*cos(th3)+0.8*sin(th3),...
-0.10*cos(th3)+1.0*sin(th3),...
0.25*cos(th3)+1.2*sin(th3),...
0.03*cos(th3)+1.27*sin(th3),...
0.03*cos(th3)+1.6*sin(th3),...
-0.03*cos(th3)+1.6*sin(th3),...
-0.03*cos(th3)+1.27*sin(th3),...
0.10*cos(th3)+1.2*sin(th3),...
-0.25*cos(th3)+1.0*sin(th3),...
0.10*cos(th3)+0.8*sin(th3),...
-0.25*cos(th3)+0.6*sin(th3),...
0.10*cos(th3)+0.4*sin(th3),...
-0.03*cos(th3)+0.33*sin(th3),...
-0.03*cos(th3)];

x04=-3.0;
y04=-2.5;
th4=pi/2;

xres_41=x04+[0.25*sin(th4),0.25*sin(th4)+1.6*cos(th4),...
-0.25*sin(th4)+1.6*cos(th4),-0.25*sin(th4)];
yres_41=y04+[-0.25*cos(th4),-0.25*cos(th4)+1.6*sin(th4),...
0.25*cos(th4)+1.6*sin(th4),0.25*cos(th4)];

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```

xres_42=x04+[-0.03*sin(th4),-0.03*sin(th4)+0.33*cos(th4),...
-0.25*sin(th4)+0.4*cos(th4),...
0.10*sin(th4)+0.6*cos(th4),...
-0.25*sin(th4)+0.8*cos(th4),...
0.10*sin(th4)+1.0*cos(th4),...
-0.25*sin(th4)+1.2*cos(th4),...
-0.03*sin(th4)+1.27*cos(th4),...
-0.03*sin(th4)+1.6*cos(th4),...
0.03*sin(th4)+1.6*cos(th4),...
0.03*sin(th4)+1.27*cos(th4),...
-0.10*sin(th4)+1.2*cos(th4),...
0.25*sin(th4)+1.0*cos(th4),...
-0.10*sin(th4)+0.8*cos(th4),...
0.25*sin(th4)+0.6*cos(th4),...
-0.10*sin(th4)+0.4*cos(th4),...
0.03*sin(th4)+0.33*cos(th4),...
0.03*sin(th4)];
yres_42=y04+[0.03*cos(th4),0.03*cos(th4)+0.33*sin(th4),...
0.25*cos(th4)+0.4*sin(th4),...
-0.10*cos(th4)+0.6*sin(th4),...
0.25*cos(th4)+0.8*sin(th4),...
-0.10*cos(th4)+1.0*sin(th4),...
0.25*cos(th4)+1.2*sin(th4),...
0.03*cos(th4)+1.27*sin(th4),...
0.03*cos(th4)+1.6*sin(th4),...
-0.03*cos(th4)+1.6*sin(th4),...
-0.03*cos(th4)+1.27*sin(th4),...
0.10*cos(th4)+1.2*sin(th4),...
-0.25*cos(th4)+1.0*sin(th4),...
0.10*cos(th4)+0.8*sin(th4),...
-0.25*cos(th4)+0.6*sin(th4),...
0.10*cos(th4)+0.4*sin(th4),...
-0.03*cos(th4)+0.33*sin(th4),...
-0.03*cos(th4)];

x05=1.0;
y05=0.5;
th5=0;

xres_51=x05+[0.40*sin(th5),0.40*sin(th5)+1.2*cos(th5),...
-0.40*sin(th5)+1.2*cos(th5),-0.40*sin(th5)];
yres_51=y05+[-0.40*cos(th5),-0.40*cos(th5)+1.2*sin(th5),...
0.40*cos(th5)+1.2*sin(th5),0.40*cos(th5)];

xres_52=x05+[-0.05*sin(th5),-0.05*sin(th5)+0.25*cos(th5),...
-0.40*sin(th5)+0.3*cos(th5),...
0.25*sin(th5)+0.45*cos(th5),...
-0.40*sin(th5)+0.6*cos(th5),...
0.25*sin(th5)+0.75*cos(th5),...
-0.40*sin(th5)+0.9*cos(th5),...
-0.05*sin(th5)+0.95*cos(th5),...
-0.05*sin(th5)+1.2*cos(th5),...
0.05*sin(th5)+1.2*cos(th5),...
0.05*sin(th5)+0.95*cos(th5),...
-0.25*sin(th5)+0.9*cos(th5),...
0.40*sin(th5)+0.75*cos(th5),...
-0.25*sin(th5)+0.6*cos(th5),...
0.40*sin(th5)+0.45*cos(th5),...
-0.25*sin(th5)+0.3*cos(th5),...
0.05*sin(th5)+0.25*cos(th5),...
0.05*sin(th5)];
yres_52=y05+[0.05*cos(th5),0.05*cos(th5)+0.25*sin(th5),...
0.40*cos(th5)+0.3*sin(th5),...
-0.25*cos(th5)+0.45*sin(th5),...
0.40*cos(th5)+0.6*sin(th5),...
-0.25*cos(th5)+0.75*sin(th5),...
0.40*cos(th5)+0.9*sin(th5),...
0.05*cos(th5)+0.95*sin(th5),...
0.05*cos(th5)+1.2*sin(th5),...
-0.05*cos(th5)+1.2*sin(th5),...
-0.05*cos(th5)+0.95*sin(th5),...
0.25*cos(th5)+0.9*sin(th5),...
-0.40*cos(th5)+0.75*sin(th5),...
0.25*cos(th5)+0.6*sin(th5),...
-0.40*cos(th5)+0.45*sin(th5),...
0.25*cos(th5)+0.3*sin(th5),...
-0.05*cos(th5)+0.25*sin(th5),...
-0.05*cos(th5)];

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```

x06=6.0;
y06=-2.5;
th6=pi/2;

xres_61=x06+[0.25*sin(th6),0.25*sin(th6)+1.6*cos(th6),...
-0.25*sin(th6)+1.6*cos(th6),-0.25*sin(th6)];
yres_61=y06+[-0.25*cos(th6),-0.25*cos(th6)+1.6*sin(th6),...
0.25*cos(th6)+1.6*sin(th6),0.25*cos(th6)];

xres_62=x06+[-0.03*sin(th6),-0.03*sin(th6)+0.33*cos(th6),...
-0.25*sin(th6)+0.4*cos(th6),...
0.10*sin(th6)+0.6*cos(th6),...
-0.25*sin(th6)+0.8*cos(th6),...
0.10*sin(th6)+1.0*cos(th6),...
-0.25*sin(th6)+1.2*cos(th6),...
-0.03*sin(th6)+1.27*cos(th6),...
-0.03*sin(th6)+1.6*cos(th6),...
0.03*sin(th6)+1.6*cos(th6),...
0.03*sin(th6)+1.27*cos(th6),...
-0.10*sin(th6)+1.2*cos(th6),...
0.25*sin(th6)+1.0*cos(th6),...
-0.10*sin(th6)+0.8*cos(th6),...
0.25*sin(th6)+0.6*cos(th6),...
-0.10*sin(th6)+0.4*cos(th6),...
0.03*sin(th6)+0.33*cos(th6),...
0.03*sin(th6)];
yres_62=y06+[0.03*cos(th6),0.03*cos(th6)+0.33*sin(th6),...
0.25*cos(th6)+0.4*sin(th6),...
-0.10*cos(th6)+0.6*sin(th6),...
0.25*cos(th6)+0.8*sin(th6),...
-0.10*cos(th6)+1.0*sin(th6),...
0.25*cos(th6)+1.2*sin(th6),...
0.03*cos(th6)+1.27*sin(th6),...
0.03*cos(th6)+1.6*sin(th6),...
-0.03*cos(th6)+1.6*sin(th6),...
-0.03*cos(th6)+1.27*sin(th6),...
0.10*cos(th6)+1.2*sin(th6),...
-0.25*cos(th6)+1.0*sin(th6),...
0.10*cos(th6)+0.8*sin(th6),...
-0.25*cos(th6)+0.6*sin(th6),...
0.10*cos(th6)+0.4*sin(th6),...
-0.03*cos(th6)+0.33*sin(th6),...
-0.03*cos(th6)];

x07=-9.5;
y07=0;

xv1_1=x07+[-1.0,1.0,1.0,-1.0];
yv1_1=y07+[-0.05,-0.05,0.05,0.05]+0.3;

xv1_2=x07+[-0.4,0.4,0.4,-0.4];
yv1_2=y07+[-0.1,-0.1,0.1,0.1]-0.1;

x08=6.0;
y08=2.5;
phi8=0:0.01:2*pi;

xI1_1=x08+0.6*cos(phi8);
yI1_1=y08+0.9*sin(phi8);

xI1_2=x08+0.55*cos(phi8);
yI1_2=y08+0.85*sin(phi8);

xI1_3=x08+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI1_3=y08+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

x09=-6.0;
y09=0.5;
phi9=0:0.01:2*pi;

xI2_1=x09+0.6*cos(phi9);
yI2_1=y09+0.9*sin(phi9);

xI2_2=x09+0.55*cos(phi9);
yI2_2=y09+0.85*sin(phi9);

xI2_3=x09+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI2_3=y09+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

```

```

        xcable1=[-9.5,-9.5,-8,-8];
        ycable1=y02+[0.1,-0.1,-0.1,0.1];

        xcable2=[-9.55,-9.45,-9.45,-9.55];
        ycable2=[y02+0.1,y02+0.1,y07+0.35,y07+0.35];

        xcable3=[-9.55,-9.45,-9.45,-9.55];
        ycable3=[y01,y01,y07-0.2,y07-0.2];

        xcable4=[-9.5,-9.5,x01,x01];
        ycable4=y01+[0.1,-0.1,-0.1,0.1];

        xcable5=[9.5,9.5,x01+1.2,x01+1.2];
        ycable5=y01+[0.1,-0.1,-0.1,0.1];

        xcable6=[9.5,9.5,x02+1.2,x02+1.2];
        ycable6=y02+[0.1,-0.1,-0.1,0.1];

        xcable7=[-9.55,-9.45,-9.45,-9.55]+6.5;
        ycable7=[y02,y02,y03+1.6,y03+1.6];

        xcable8=[-9.55,-9.45,-9.45,-9.55]+6.5;
        ycable8=[y04+1.6,y04+1.6,y03,y03];

        xcable9=[-9.55,-9.45,-9.45,-9.55]+6.5;
        ycable9=[y04,y04,y01,y01];

        xcable10=[-3.0,-3.0,x05,x05];
        ycable10=y05+[0.1,-0.1,-0.1,0.1];

        xcable11=[x06,x06,x05+1.2,x05+1.2];
        ycable11=y05+[0.1,-0.1,-0.1,0.1];

        xcable12=[-9.55,-9.45,-9.45,-9.55]+15.5;
        ycable12=[y02,y02,y08+0.9,y08+0.9];

        xcable13=[-9.55,-9.45,-9.45,-9.55]+15.5;
        ycable13=[y06+1.6,y06+1.6,y08-0.9,y08-0.9];

        xcable14=[-9.55,-9.45,-9.45,-9.55]+15.5;
        ycable14=[y06,y06,y01,y01];

        xcable15=[-9.5,-9.5,x09,x09];
        ycable15=y02+[0.1,-0.1,-0.1,0.1]-2.0;

        xcable16=[-9.55,-9.45,-9.45,-9.55]+3.5;
        ycable16=[y02-1.9,y02-1.9,y09+0.9,y09+0.9];

        xcable17=[-9.55,-9.45,-9.45,-9.55]+3.5;
        ycable17=[y01,y01,y09-0.9,y09-0.9];

        xI_1=x02+2.5+[0.0,0.0,1.0,1.0,1.5,1.0,1.0];
        yI_1=y02+[0.1,-0.1,-0.1,-0.3,0.0,0.3,0.1];

        fill(x_back,y_back,[1.0,1.0,1.0],...
        x_tableau,y_tableau,[0.6,0.6,0.6],...
        xres_11,yres_11,[1.0,1.0,1.0],...
        xres_12,yres_12,[0.0,0.0,0.0],...
        xres_21,yres_21,[1.0,1.0,1.0],...
        xres_22,yres_22,[0.0,0.0,0.0],...
        xres_31,yres_31,[1.0,1.0,1.0],...
        xres_32,yres_32,[0.0,0.0,0.0],...
        xres_41,yres_41,[1.0,1.0,1.0],...
        xres_42,yres_42,[0.0,0.0,0.0],...
        xres_51,yres_51,[1.0,1.0,1.0],...
        xres_52,yres_52,[0.0,0.0,0.0],...
        xres_61,yres_61,[1.0,1.0,1.0],...
        xres_62,yres_62,[0.0,0.0,0.0],...
        xV1_1,yV1_1,[0.0,0.0,0.0],...
        xV1_2,yV1_2,[0.0,0.0,0.0],...
        xI1_1,yI1_1,[0.0,0.0,0.0],...
        xI1_2,yI1_2,[1.0,1.0,1.0],...
        xI1_3,yI1_3,[0.0,0.0,0.0],...
        xI2_1,yI2_1,[0.0,0.0,0.0],...
        xI2_2,yI2_2,[1.0,1.0,1.0],...
        xI2_3,yI2_3,[0.0,0.0,0.0],...
        xcable1,ycable1,[0.8,0.6,0.2],...
        xcable2,ycable2,[0.8,0.6,0.2],...

```

```

xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
xcable10,ycable10,[0.8,0.6,0.2],...
xcable11,ycable11,[0.8,0.6,0.2],...
xcable12,ycable12,[0.8,0.6,0.2],...
xcable13,ycable13,[0.8,0.6,0.2],...
xcable14,ycable14,[0.8,0.6,0.2],...
xcable15,ycable15,[0.8,0.6,0.2],...
xcable16,ycable16,[0.8,0.6,0.2],...
xcable17,ycable17,[0.8,0.6,0.2],...
xI_1,yI_1,[0.0,0.0,0.0],...
'Linestyle','None')

text(-11,11,'Υπολογίζουμε κατ' αρχήν το ισοδύναμο Thevenin του κυκλώματος από τα άκρα c, d. Θα έχουμε')
text(9.7,y02,'a','Color',[0.9,0.0,0.0])
text(9.7,y01,'b','Color',[0.9,0.0,0.0])
text(x01+0.5,y01-1.5,'R_1','Color',[0.9,0.2,0.0])
text(x02+0.5,y02+1.5,'R_2','Color',[0.9,0.2,0.0])
text(x03+0.5,y03+0.75,'R_3','Color',[0.9,0.2,0.0])
text(x04+0.5,y04+0.75,'R_4','Color',[0.9,0.2,0.0])
text(x05+0.5,y05-1.5,'R_5','Color',[0.9,0.2,0.0])
text(x06+0.5,y06+0.75,'R_6','Color',[0.9,0.2,0.0])
text(x07-0.75,y07+1.0,'V_1','Color',[0.0,0.2,0.9])
text(x09+0.85,y09,'J_1','Color',[0.0,0.2,0.9])
text(x08+0.85,y08,'2I_1','Color',[0.0,0.2,0.9])
text(x02+3.0,y02-1.0,'I_1','Color',[0.0,0.2,0.9])
text(-9.7,y02+1.0,'c','Color',[0.9,0.0,0.0])
text(x04,y01-1.0,'d','Color',[0.9,0.0,0.0])

axis([-12,12,-12,12])
axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

% --- Executes on button press in pushbutton2.
function pushbutton2_Callback(hObject, eventdata, handles)
% hObject handle to pushbutton2 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
global R1;
global R2;
global R3;
global R4;
global R5;
global R6;
global V1;
global J1;

global snmeio;

snmeio=snmeio+1;

if (snmeio==7)
snmeio=1;
end

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
nR1=num2str(0.01*round(100*R1));
IN1=(V1/R1)+J1;
nIN1=num2str(0.01*round(100*IN1));
VT1=IN1*R1;
nVT1=num2str(0.01*round(100*VT1));
R12=R1+R2;
nR12=num2str(0.01*round(100*R12));
R45=R4*R5/(R4+R5+R6);
nR45=num2str(0.01*round(100*R45));
R46=R4*R6/(R4+R5+R6);
nR46=num2str(0.01*round(100*R46));
R56=R6*R5/(R4+R5+R6);
nR56=num2str(0.01*round(100*R56));
R345=R3+R45;

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nR345=num2str(0.01*round(100*R345));
dR345=2*R345;
ndR345=num2str(0.01*round(100*dR345));
R3456=R3+R45+R46;
nR3456=num2str(0.01*round(100*R3456));
I1=VT1/(R12+2*R345+R3456);
nI1=num2str(0.01*round(100*I1));
VT=2*R345*I1+R3456*I1;
nVT=num2str(0.01*round(100*VT));
IN=VT1/R12+2*R345*VT1/(R12*R3456);
nIN=num2str(0.01*round(100*IN));
RT=VT/IN;
nRT=num2str(0.01*round(100*RT));
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
if (snmeio==1)
axes(handles.axes1);
cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,9,9];

x01=-8.0;
y01=-5;
th1=0;

xres_11=x01+[0.40*sin(th1),0.40*sin(th1)+1.2*cos(th1),...
-0.40*sin(th1)+1.2*cos(th1),-0.40*sin(th1)];
yres_11=y01+[-0.40*cos(th1),-0.40*cos(th1)+1.2*sin(th1),...
0.40*cos(th1)+1.2*sin(th1),0.40*cos(th1)];

xres_12=x01+[-0.05*sin(th1),-0.05*sin(th1)+0.25*cos(th1),...
-0.40*sin(th1)+0.3*cos(th1),...
0.25*sin(th1)+0.45*cos(th1),...
-0.40*sin(th1)+0.6*cos(th1),...
0.25*sin(th1)+0.75*cos(th1),...
-0.40*sin(th1)+0.9*cos(th1),...
-0.05*sin(th1)+0.95*cos(th1),...
-0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+0.95*cos(th1),...
-0.25*sin(th1)+0.9*cos(th1),...
0.40*sin(th1)+0.75*cos(th1),...
-0.25*sin(th1)+0.6*cos(th1),...
0.40*sin(th1)+0.45*cos(th1),...
-0.25*sin(th1)+0.3*cos(th1),...
0.05*sin(th1)+0.25*cos(th1),...
0.05*sin(th1)];
yres_12=y01+[0.05*cos(th1),0.05*cos(th1)+0.25*sin(th1),...
0.40*cos(th1)+0.3*sin(th1),...
-0.25*cos(th1)+0.45*sin(th1),...
0.40*cos(th1)+0.6*sin(th1),...
-0.25*cos(th1)+0.75*sin(th1),...
0.40*cos(th1)+0.9*sin(th1),...
0.05*cos(th1)+0.95*sin(th1),...
0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+0.95*sin(th1),...
0.25*cos(th1)+0.9*sin(th1),...
-0.40*cos(th1)+0.75*sin(th1),...
0.25*cos(th1)+0.6*sin(th1),...
-0.40*cos(th1)+0.45*sin(th1),...
0.25*cos(th1)+0.3*sin(th1),...
-0.05*cos(th1)+0.25*sin(th1),...
-0.05*cos(th1)];

x02=-8.0;
y02=5;
th2=0;

xres_21=x02+[0.40*sin(th2),0.40*sin(th2)+1.2*cos(th2),...
-0.40*sin(th2)+1.2*cos(th2),-0.40*sin(th2)];
yres_21=y02+[-0.40*cos(th2),-0.40*cos(th2)+1.2*sin(th2),...
0.40*cos(th2)+1.2*sin(th2),0.40*cos(th2)];

xres_22=x02+[-0.05*sin(th2),-0.05*sin(th2)+0.25*cos(th2),...
-0.40*sin(th2)+0.3*cos(th2),...
0.25*sin(th2)+0.45*cos(th2),...

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```

-0.40*sin(th2)+0.6*cos(th2),...
0.25*sin(th2)+0.75*cos(th2),...
-0.40*sin(th2)+0.9*cos(th2),...
-0.05*sin(th2)+0.95*cos(th2),...
-0.05*sin(th2)+1.2*cos(th2),...
0.05*sin(th2)+1.2*cos(th2),...
0.05*sin(th2)+0.95*cos(th2),...
-0.25*sin(th2)+0.9*cos(th2),...
0.40*sin(th2)+0.75*cos(th2),...
-0.25*sin(th2)+0.6*cos(th2),...
0.40*sin(th2)+0.45*cos(th2),...
-0.25*sin(th2)+0.3*cos(th2),...
0.05*sin(th2)+0.25*cos(th2),...
0.05*sin(th2)];
yres_22=y02+[0.05*cos(th2),0.05*cos(th2)+0.25*sin(th2),...
0.40*cos(th2)+0.3*sin(th2),...
-0.25*cos(th2)+0.45*sin(th2),...
0.40*cos(th2)+0.6*sin(th2),...
-0.250*cos(th2)+0.75*sin(th2),...
0.40*cos(th2)+0.9*sin(th2),...
0.05*cos(th2)+0.95*sin(th2),...
0.05*cos(th2)+1.2*sin(th2),...
-0.05*cos(th2)+1.2*sin(th2),...
-0.05*cos(th2)+0.95*sin(th2),...
0.25*cos(th2)+0.9*sin(th2),...
-0.40*cos(th2)+0.75*sin(th2),...
0.25*cos(th2)+0.6*sin(th2),...
-0.40*cos(th2)+0.45*sin(th2),...
0.25*cos(th2)+0.3*sin(th2),...
-0.05*cos(th2)+0.25*sin(th2),...
-0.05*cos(th2)];
x03=-3.0;
y03=2.5;
th3=pi/2;
xres_31=x03+[0.25*sin(th3),0.25*sin(th3)+1.6*cos(th3),...
-0.25*sin(th3)+1.6*cos(th3),-0.25*sin(th3)];
yres_31=y03+[-0.25*cos(th3),-0.25*cos(th3)+1.6*sin(th3),...
0.25*cos(th3)+1.6*sin(th3),0.25*cos(th3)];
xres_32=x03+[-0.03*sin(th3),-0.03*sin(th3)+0.33*cos(th3),...
-0.25*sin(th3)+0.4*cos(th3),...
0.10*sin(th3)+0.6*cos(th3),...
-0.25*sin(th3)+0.8*cos(th3),...
0.10*sin(th3)+1.0*cos(th3),...
-0.25*sin(th3)+1.2*cos(th3),...
-0.03*sin(th3)+1.27*cos(th3),...
-0.03*sin(th3)+1.6*cos(th3),...
0.03*sin(th3)+1.6*cos(th3),...
0.03*sin(th3)+1.27*cos(th3),...
-0.10*sin(th3)+1.2*cos(th3),...
0.25*sin(th3)+1.0*cos(th3),...
-0.10*sin(th3)+0.8*cos(th3),...
0.25*sin(th3)+0.6*cos(th3),...
-0.10*sin(th3)+0.4*cos(th3),...
0.03*sin(th3)+0.33*cos(th3),...
0.03*sin(th3)];
yres_32=y03+[0.03*cos(th3),0.03*cos(th3)+0.33*sin(th3),...
0.25*cos(th3)+0.4*sin(th3),...
-0.10*cos(th3)+0.6*sin(th3),...
0.25*cos(th3)+0.8*sin(th3),...
-0.10*cos(th3)+1.0*sin(th3),...
0.25*cos(th3)+1.2*sin(th3),...
0.03*cos(th3)+1.27*sin(th3),...
0.03*cos(th3)+1.6*sin(th3),...
-0.03*cos(th3)+1.6*sin(th3),...
-0.03*cos(th3)+1.27*sin(th3),...
0.10*cos(th3)+1.2*sin(th3),...
-0.25*cos(th3)+1.0*sin(th3),...
0.10*cos(th3)+0.8*sin(th3),...
-0.25*cos(th3)+0.6*sin(th3),...
0.10*cos(th3)+0.4*sin(th3),...
-0.03*cos(th3)+0.33*sin(th3),...
-0.03*cos(th3)];
x04=-3.0;
y04=-2.5;
th4=pi/2;
xres_41=x04+[0.25*sin(th4),0.25*sin(th4)+1.6*cos(th4),...

```

```

-0.25*sin(th4)+1.6*cos(th4),-0.25*sin(th4)];
yres_41=y04+[-0.25*cos(th4),-0.25*cos(th4)+1.6*sin(th4),...
0.25*cos(th4)+1.6*sin(th4),0.25*cos(th4)];

xres_42=x04+[-0.03*sin(th4),-0.03*sin(th4)+0.33*cos(th4),...
-0.25*sin(th4)+0.4*cos(th4),...
0.10*sin(th4)+0.6*cos(th4),...
-0.25*sin(th4)+0.8*cos(th4),...
0.10*sin(th4)+1.0*cos(th4),...
-0.25*sin(th4)+1.2*cos(th4),...
-0.03*sin(th4)+1.27*cos(th4),...
-0.03*sin(th4)+1.6*cos(th4),...
0.03*sin(th4)+1.6*cos(th4),...
0.03*sin(th4)+1.27*cos(th4),...
-0.10*sin(th4)+1.2*cos(th4),...
0.25*sin(th4)+1.0*cos(th4),...
-0.10*sin(th4)+0.8*cos(th4),...
0.25*sin(th4)+0.6*cos(th4),...
-0.10*sin(th4)+0.4*cos(th4),...
0.03*sin(th4)+0.33*cos(th4),...
0.03*sin(th4)];
yres_42=y04+[0.03*cos(th4),0.03*cos(th4)+0.33*sin(th4),...
0.25*cos(th4)+0.4*sin(th4),...
-0.10*cos(th4)+0.6*sin(th4),...
0.25*cos(th4)+0.8*sin(th4),...
-0.10*cos(th4)+1.0*sin(th4),...
0.25*cos(th4)+1.2*sin(th4),...
0.03*cos(th4)+1.27*sin(th4),...
0.03*cos(th4)+1.6*sin(th4),...
-0.03*cos(th4)+1.6*sin(th4),...
-0.03*cos(th4)+1.27*sin(th4),...
0.10*cos(th4)+1.2*sin(th4),...
-0.25*cos(th4)+1.0*sin(th4),...
0.10*cos(th4)+0.8*sin(th4),...
-0.25*cos(th4)+0.6*sin(th4),...
0.10*cos(th4)+0.4*sin(th4),...
-0.03*cos(th4)+0.33*sin(th4),...
-0.03*cos(th4)];

x05=1.0;
y05=0.5;
th5=0;

xres_51=x05+[0.40*sin(th5),0.40*sin(th5)+1.2*cos(th5),...
-0.40*sin(th5)+1.2*cos(th5),-0.40*sin(th5)];
yres_51=y05+[-0.40*cos(th5),-0.40*cos(th5)+1.2*sin(th5),...
0.40*cos(th5)+1.2*sin(th5),0.40*cos(th5)];

xres_52=x05+[-0.05*sin(th5),-0.05*sin(th5)+0.25*cos(th5),...
-0.40*sin(th5)+0.3*cos(th5),...
0.25*sin(th5)+0.45*cos(th5),...
-0.40*sin(th5)+0.6*cos(th5),...
0.25*sin(th5)+0.75*cos(th5),...
-0.40*sin(th5)+0.9*cos(th5),...
-0.05*sin(th5)+0.95*cos(th5),...
-0.05*sin(th5)+1.2*cos(th5),...
0.05*sin(th5)+1.2*cos(th5),...
0.05*sin(th5)+0.95*cos(th5),...
-0.25*sin(th5)+0.9*cos(th5),...
0.40*sin(th5)+0.75*cos(th5),...
-0.25*sin(th5)+0.6*cos(th5),...
0.40*sin(th5)+0.45*cos(th5),...
-0.25*sin(th5)+0.3*cos(th5),...
0.05*sin(th5)+0.25*cos(th5),...
0.05*sin(th5)];
yres_52=y05+[0.05*cos(th5),0.05*cos(th5)+0.25*sin(th5),...
0.40*cos(th5)+0.3*sin(th5),...
-0.25*cos(th5)+0.45*sin(th5),...
0.40*cos(th5)+0.6*sin(th5),...
-0.25*cos(th5)+0.75*sin(th5),...
0.40*cos(th5)+0.9*sin(th5),...
0.05*cos(th5)+0.95*sin(th5),...
0.05*cos(th5)+1.2*sin(th5),...
-0.05*cos(th5)+1.2*sin(th5),...
-0.05*cos(th5)+0.95*sin(th5),...
0.25*cos(th5)+0.9*sin(th5),...
-0.40*cos(th5)+0.75*sin(th5),...
0.25*cos(th5)+0.6*sin(th5),...
-0.40*cos(th5)+0.45*sin(th5),...
0.25*cos(th5)+0.3*sin(th5),...
0.05*cos(th5)+0.25*sin(th5),...
0.05*cos(th5)];

```

```

-0.05*cos(th5)+0.25*sin(th5),...
-0.05*cos(th5)];

x06=6.0;
y06=-2.5;
th6=pi/2;

xres_61=x06+[0.25*sin(th6),0.25*sin(th6)+1.6*cos(th6),...
-0.25*sin(th6)+1.6*cos(th6),-0.25*sin(th6)];
yres_61=y06+[-0.25*cos(th6),-0.25*cos(th6)+1.6*sin(th6),...
0.25*cos(th6)+1.6*sin(th6),0.25*cos(th6)];

xres_62=x06+[-0.03*sin(th6),-0.03*sin(th6)+0.33*cos(th6),...
-0.25*sin(th6)+0.4*cos(th6),...
0.10*sin(th6)+0.6*cos(th6),...
-0.25*sin(th6)+0.8*cos(th6),...
0.10*sin(th6)+1.0*cos(th6),...
-0.25*sin(th6)+1.2*cos(th6),...
-0.03*sin(th6)+1.27*cos(th6),...
-0.03*sin(th6)+1.6*cos(th6),...
0.03*sin(th6)+1.6*cos(th6),...
0.03*sin(th6)+1.27*cos(th6),...
-0.10*sin(th6)+1.2*cos(th6),...
0.25*sin(th6)+1.0*cos(th6),...
-0.10*sin(th6)+0.8*cos(th6),...
0.25*sin(th6)+0.6*cos(th6),...
-0.10*sin(th6)+0.4*cos(th6),...
0.03*sin(th6)+0.33*cos(th6),...
0.03*sin(th6)];
yres_62=y06+[0.03*cos(th6),0.03*cos(th6)+0.33*sin(th6),...
0.25*cos(th6)+0.4*sin(th6),...
-0.10*cos(th6)+0.6*sin(th6),...
0.25*cos(th6)+0.8*sin(th6),...
-0.10*cos(th6)+1.0*sin(th6),...
0.25*cos(th6)+1.2*sin(th6),...
0.03*cos(th6)+1.27*sin(th6),...
0.03*cos(th6)+1.6*sin(th6),...
-0.03*cos(th6)+1.6*sin(th6),...
-0.03*cos(th6)+1.27*sin(th6),...
0.10*cos(th6)+1.2*sin(th6),...
-0.25*cos(th6)+1.0*sin(th6),...
0.10*cos(th6)+0.8*sin(th6),...
-0.25*cos(th6)+0.6*sin(th6),...
0.10*cos(th6)+0.4*sin(th6),...
-0.03*cos(th6)+0.33*sin(th6),...
-0.03*cos(th6)];

x07=-9.5;
y07=0;

xv1_1=x07+[-1.0,1.0,1.0,-1.0];
yv1_1=y07+[-0.05,-0.05,0.05,0.05]+0.3;

xv1_2=x07+[-0.4,0.4,0.4,-0.4];
yv1_2=y07+[-0.1,-0.1,0.1,0.1]-0.1;

x08=6.0;
y08=2.5;
phi8=0:0.01:2*pi;

xI1_1=x08+0.6*cos(phi8);
yI1_1=y08+0.9*sin(phi8);

xI1_2=x08+0.55*cos(phi8);
yI1_2=y08+0.85*sin(phi8);

xI1_3=x08+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI1_3=y08+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

x09=-6.0;
y09=0.5;
phi9=0:0.01:2*pi;

xI2_1=x09+0.6*cos(phi9);
yI2_1=y09+0.9*sin(phi9);

xI2_2=x09+0.55*cos(phi9);
yI2_2=y09+0.85*sin(phi9);

```

```

xI2_3=x09+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI2_3=y09+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

xcable1=[-9.5,-9.5,-8,-8];
ycable1=y02+[0.1,-0.1,-0.1,0.1];

xcable2=[-9.55,-9.45,-9.45,-9.55];
ycable2=[y02+0.1,y02+0.1,y07+0.35,y07+0.35];

xcable3=[-9.55,-9.45,-9.45,-9.55];
ycable3=[y01,y01,y07-0.2,y07-0.2];

xcable4=[-9.5,-9.5,x01,x01];
ycable4=y01+[0.1,-0.1,-0.1,0.1];

xcable5=[9.5,9.5,x01+1.2,x01+1.2];
ycable5=y01+[0.1,-0.1,-0.1,0.1];

xcable6=[9.5,9.5,x02+1.2,x02+1.2];
ycable6=y02+[0.1,-0.1,-0.1,0.1];

xcable7=[-9.55,-9.45,-9.45,-9.55]+6.5;
ycable7=[y02,y02,y03+1.6,y03+1.6];

xcable8=[-9.55,-9.45,-9.45,-9.55]+6.5;
ycable8=[y04+1.6,y04+1.6,y03,y03];

xcable9=[-9.55,-9.45,-9.45,-9.55]+6.5;
ycable9=[y04,y04,y01,y01];

xcable10=[-3.0,-3.0,x05,x05];
ycable10=y05+[0.1,-0.1,-0.1,0.1];

xcable11=[x06,x06,x05+1.2,x05+1.2];
ycable11=y05+[0.1,-0.1,-0.1,0.1];

xcable12=[-9.55,-9.45,-9.45,-9.55]+15.5;
ycable12=[y02,y02,y08+0.9,y08+0.9];

xcable13=[-9.55,-9.45,-9.45,-9.55]+15.5;
ycable13=[y06+1.6,y06+1.6,y08-0.9,y08-0.9];

xcable14=[-9.55,-9.45,-9.45,-9.55]+15.5;
ycable14=[y06,y06,y01,y01];

xcable15=[-9.5,-9.5,x09,x09];
ycable15=y02+[0.1,-0.1,-0.1,0.1]-2.0;

xcable16=[-9.55,-9.45,-9.45,-9.55]+3.5;
ycable16=[y02-1.9,y02-1.9,y09+0.9,y09+0.9];

xcable17=[-9.55,-9.45,-9.45,-9.55]+3.5;
ycable17=[y01,y01,y09-0.9,y09-0.9];

xI_1=x02+2.5+[0.0,0.0,1.0,1.0,1.5,1.0,1.0];
yI_1=y02+[0.1,-0.1,-0.1,-0.3,0.0,0.3,0.1];

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_11,yres_11,[1.0,1.0,1.0],...
xres_12,yres_12,[0.0,0.0,0.0],...
xres_21,yres_21,[1.0,1.0,1.0],...
xres_22,yres_22,[0.0,0.0,0.0],...
xres_31,yres_31,[1.0,1.0,1.0],...
xres_32,yres_32,[0.0,0.0,0.0],...
xres_41,yres_41,[1.0,1.0,1.0],...
xres_42,yres_42,[0.0,0.0,0.0],...
xres_51,yres_51,[1.0,1.0,1.0],...
xres_52,yres_52,[0.0,0.0,0.0],...
xres_61,yres_61,[1.0,1.0,1.0],...
xres_62,yres_62,[0.0,0.0,0.0],...
xV1_1,yV1_1,[0.0,0.0,0.0],...
xV1_2,yV1_2,[0.0,0.0,0.0],...
xI1_1,yI1_1,[0.0,0.0,0.0],...
xI1_2,yI1_2,[1.0,1.0,1.0],...
xI1_3,yI1_3,[0.0,0.0,0.0],...
xI2_1,yI2_1,[0.0,0.0,0.0],...
xI2_2,yI2_2,[1.0,1.0,1.0],...

```

```

        xI2_3,yI2_3,[0.0,0.0,0.0],...
        xcable1,ycable1,[0.8,0.6,0.2],...
        xcable2,ycable2,[0.8,0.6,0.2],...
        xcable3,ycable3,[0.8,0.6,0.2],...
        xcable4,ycable4,[0.8,0.6,0.2],...
        xcable5,ycable5,[0.8,0.6,0.2],...
        xcable6,ycable6,[0.8,0.6,0.2],...
        xcable7,ycable7,[0.8,0.6,0.2],...
        xcable8,ycable8,[0.8,0.6,0.2],...
        xcable9,ycable9,[0.8,0.6,0.2],...
        xcable10,ycable10,[0.8,0.6,0.2],...
        xcable11,ycable11,[0.8,0.6,0.2],...
        xcable12,ycable12,[0.8,0.6,0.2],...
        xcable13,ycable13,[0.8,0.6,0.2],...
        xcable14,ycable14,[0.8,0.6,0.2],...
        xcable15,ycable15,[0.8,0.6,0.2],...
        xcable16,ycable16,[0.8,0.6,0.2],...
        xcable17,ycable17,[0.8,0.6,0.2],...
        xI_1,yI_1,[0.0,0.0,0.0],...
        'LineStyle','None')

text(-11,11,'Υπολογίζουμε κατ' αρχήν το ισοδύναμο Thevenin του κυκλώματος από τα άκρα c, d. Θα έχουμε')
text(9.7,y02,'a','Color',[0.9,0.0,0.0])
text(9.7,y01,'b','Color',[0.9,0.0,0.0])
text(x01+0.5,y01-1.5,'R_1','Color',[0.9,0.2,0.0])
text(x02+0.5,y02+1.5,'R_2','Color',[0.9,0.2,0.0])
text(x03+0.5,y03+0.75,'R_3','Color',[0.9,0.2,0.0])
text(x04+0.5,y04+0.75,'R_4','Color',[0.9,0.2,0.0])
text(x05+0.5,y05-1.5,'R_5','Color',[0.9,0.2,0.0])
text(x06+0.5,y06+0.75,'R_6','Color',[0.9,0.2,0.0])
text(x07-0.75,y07+1.0,'V_1','Color',[0.0,0.2,0.9])
text(x09+0.85,y09,'J_1','Color',[0.0,0.2,0.9])
text(x08+0.85,y08,'2I_1','Color',[0.0,0.2,0.9])
text(x02+3.0,y02-1.0,'I_1','Color',[0.0,0.2,0.9])
text(-9.7,y02+1.0,'c','Color',[0.9,0.0,0.0])
text(x04,y01-1.0,'d','Color',[0.9,0.0,0.0])

axis([-12,12,-12,12])
axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
elseif (snmeio==2)
axes(handles.axes1);
cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,8.5,8.5];

x01=-8.0;
y01=-5;
th1=0;

xres_11=x01+[0.40*sin(th1),0.40*sin(th1)+1.2*cos(th1),...
-0.40*sin(th1)+1.2*cos(th1),-0.40*sin(th1)];
yres_11=y01+[-0.40*cos(th1),-0.40*cos(th1)+1.2*sin(th1),...
0.40*cos(th1)+1.2*sin(th1),0.40*cos(th1)];

xres_12=x01+[-0.05*sin(th1),-0.05*sin(th1)+0.25*cos(th1),...
-0.40*sin(th1)+0.3*cos(th1),...
0.25*sin(th1)+0.45*cos(th1),...
-0.40*sin(th1)+0.6*cos(th1),...
0.25*sin(th1)+0.75*cos(th1),...
-0.40*sin(th1)+0.9*cos(th1),...
-0.05*sin(th1)+0.95*cos(th1),...
-0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+0.95*cos(th1),...
-0.25*sin(th1)+0.9*cos(th1),...
0.40*sin(th1)+0.75*cos(th1),...
-0.25*sin(th1)+0.6*cos(th1),...
0.40*sin(th1)+0.45*cos(th1),...
-0.25*sin(th1)+0.3*cos(th1),...
0.05*sin(th1)+0.25*cos(th1),...
0.05*sin(th1)];
yres_12=y01+[0.05*cos(th1),0.05*cos(th1)+0.25*sin(th1),...
0.40*cos(th1)+0.3*sin(th1),...
-0.25*cos(th1)+0.45*sin(th1),...

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0.40*cos(th1)+0.6*sin(th1),...
-0.250*cos(th1)+0.75*sin(th1),...
0.40*cos(th1)+0.9*sin(th1),...
0.05*cos(th1)+0.95*sin(th1),...
0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+0.95*sin(th1),...
0.25*cos(th1)+0.9*sin(th1),...
-0.40*cos(th1)+0.75*sin(th1),...
0.25*cos(th1)+0.6*sin(th1),...
-0.40*cos(th1)+0.45*sin(th1),...
0.25*cos(th1)+0.3*sin(th1),...
-0.05*cos(th1)+0.25*sin(th1),...
-0.05*cos(th1)];

y02=5;

x07=-9.5;
y07=0;

xv1_1=x07+[-1.0,1.0,1.0,-1.0];
yv1_1=y07+[-0.05,-0.05,0.05,0.05]+0.3;

xv1_2=x07+[-0.4,0.4,0.4,-0.4];
yv1_2=y07+[-0.1,-0.1,0.1,0.1]-0.1;

x09=-6.0;
y09=0.5;
phi9=0:0.01:2*pi;

xI2_1=x09+0.6*cos(phi9);
yI2_1=y09+0.9*sin(phi9);

xI2_2=x09+0.55*cos(phi9);
yI2_2=y09+0.85*sin(phi9);

xI2_3=x09+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI2_3=y09+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

xcable1=[-9.5,-9.5,-2,-2];
ycable1=y02+[0.1,-0.1,-0.1,0.1];

xcable2=[-9.55,-9.45,-9.45,-9.55];
ycable2=[y02+0.1,y02+0.1,y07+0.35,y07+0.35];

xcable3=[-9.55,-9.45,-9.45,-9.55];
ycable3=[y01,y01,y07-0.2,y07-0.2];

xcable4=[-9.5,-9.5,x01,x01];
ycable4=y01+[0.1,-0.1,-0.1,0.1];

xcable5=[-2.0,-2.0,x01+1.2,x01+1.2];
ycable5=y01+[0.1,-0.1,-0.1,0.1];

xcable6=[-9.55,-9.45,-9.45,-9.55]+3.5;
ycable6=[y02+0.1,y02+0.1,y09+0.9,y09+0.9];

xcable7=[-9.55,-9.45,-9.45,-9.55]+3.5;
ycable7=[y01+0.1,y01+0.1,y09-0.9,y09-0.9];

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

x01=-8.0;
y01=-5;
th1=0;

xres_11_1=x01+[0.40*sin(th1),0.40*sin(th1)+1.2*cos(th1),...
-0.40*sin(th1)+1.2*cos(th1),-0.40*sin(th1)]+10.0;
yres_11_1=y01+[-0.40*cos(th1),-0.40*cos(th1)+1.2*sin(th1),...
0.40*cos(th1)+1.2*sin(th1),0.40*cos(th1)];

xres_12_1=x01+[-0.05*sin(th1),-0.05*sin(th1)+0.25*cos(th1),...
-0.40*sin(th1)+0.3*cos(th1),...
0.25*sin(th1)+0.45*cos(th1),...
-0.40*sin(th1)+0.6*cos(th1),...
0.25*sin(th1)+0.75*cos(th1),...
-0.40*sin(th1)+0.9*cos(th1),...
-0.05*sin(th1)+0.95*cos(th1),...
-0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+0.95*cos(th1),...

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```

-0.25*sin(th1)+0.9*cos(th1),...
0.40*sin(th1)+0.75*cos(th1),...
-0.25*sin(th1)+0.6*cos(th1),...
0.40*sin(th1)+0.45*cos(th1),...
-0.25*sin(th1)+0.3*cos(th1),...
0.05*sin(th1)+0.25*cos(th1),...
0.05*sin(th1)]+10.0;
yres_12_1=y01+[0.05*cos(th1),0.05*cos(th1)+0.25*sin(th1),...
0.40*cos(th1)+0.3*sin(th1),...
-0.25*cos(th1)+0.45*sin(th1),...
0.40*cos(th1)+0.6*sin(th1),...
-0.25*cos(th1)+0.75*sin(th1),...
0.40*cos(th1)+0.9*sin(th1),...
0.05*cos(th1)+0.95*sin(th1),...
0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+0.95*sin(th1),...
0.25*cos(th1)+0.9*sin(th1),...
-0.40*cos(th1)+0.75*sin(th1),...
0.25*cos(th1)+0.6*sin(th1),...
-0.40*cos(th1)+0.45*sin(th1),...
0.25*cos(th1)+0.3*sin(th1),...
-0.05*cos(th1)+0.25*sin(th1),...
-0.05*cos(th1)];

y02=5;

x07=-9.5;
y07=0;

xv1_1_1=x07+[-1.0,1.0,1.0,-1.0]+10.0;
yv1_1_1=y07+[-0.05,-0.05,0.05,0.05]+0.3;

xv1_2_1=x07+[-0.4,0.4,0.4,-0.4]+10.0;
yv1_2_1=y07+[-0.1,-0.1,0.1,0.1]-0.1;

x09=-6.0;
y09=0.5;
phi9=0:0.01:2*pi;

xI2_1_1=x09+0.6*cos(phi9)+10.0;
yI2_1_1=y09+0.9*sin(phi9);

xI2_2_1=x09+0.55*cos(phi9)+10.0;
yI2_2_1=y09+0.85*sin(phi9);

xI2_3_1=x09+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05]+10.0;
yI2_3_1=y09+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

xcable1_1=[-9.5,-9.5,-2,-2]+10.0;
ycable1_1=y02+[0.1,-0.1,-0.1,0.1];

xcable2_1=[-9.55,-9.45,-9.45,-9.55]+10.0;
ycable2_1=[y02+0.1,y02+0.1,y07+0.35,y07+0.35];

xcable3_1=[-9.55,-9.45,-9.45,-9.55]+10.0;
ycable3_1=[y01,y01,y07-0.2,y07-0.2];

xcable4_1=[-9.5,-9.5,x01,x01]+10.0;
ycable4_1=y01+[0.1,-0.1,-0.1,0.1];

xcable5_1=[-2.0,-2.0,x01+1.2,x01+1.2]+10.0;
ycable5_1=y01+[0.1,-0.1,-0.1,0.1];

xcable6_1=[-9.55,-9.45,-9.45,-9.55]+3.5+10.0;
ycable6_1=[y02+0.1,y02+0.1,y09+0.9,y09+0.9];

xcable7_1=[-9.55,-9.45,-9.45,-9.55]+3.5+10.0;
ycable7_1=[y01+0.1,y01+0.1,y09-0.9,y09-0.9];

xcable8_1=[7.95,8.05,8.05,7.95];
ycable8_1=[y02+0.1,y02+0.1,y01-0.1,y01-0.1];

xI_n=8.0+[-0.05,0.05,0.05,0.25,0.0,-0.25,-0.05];
yI_n=y02-3.0+[0.0,0.0,-1.0,-1.0,-1.5,-1.0,-1.0];
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...

```



```

xres_11,yres_11,[1.0,1.0,1.0],...
xres_12,yres_12,[0.0,0.0,0.0],...
xV1_1,yV1_1,[0.0,0.0,0.0],...
xV1_2,yV1_2,[0.0,0.0,0.0],...
xI2_1,yI2_1,[0.0,0.0,0.0],...
xI2_2,yI2_2,[1.0,1.0,1.0],...
xI2_3,yI2_3,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xres_11_1,yres_11_1,[1.0,1.0,1.0],...
xres_12_1,yres_12_1,[0.0,0.0,0.0],...
xV1_1_1,yV1_1_1,[0.0,0.0,0.0],...
xV1_2_1,yV1_2_1,[0.0,0.0,0.0],...
xI2_1_1,yI2_1_1,[0.0,0.0,0.0],...
xI2_2_1,yI2_2_1,[1.0,1.0,1.0],...
xI2_3_1,yI2_3_1,[0.0,0.0,0.0],...
xcable1_1,ycable1_1,[0.8,0.6,0.2],...
xcable2_1,ycable2_1,[0.8,0.6,0.2],...
xcable3_1,ycable3_1,[0.8,0.6,0.2],...
xcable4_1,ycable4_1,[0.8,0.6,0.2],...
xcable5_1,ycable5_1,[0.8,0.6,0.2],...
xcable6_1,ycable6_1,[0.8,0.6,0.2],...
xcable7_1,ycable7_1,[0.8,0.6,0.2],...
xcable8_1,ycable8_1,[0.8,0.6,0.2],...
xI_n,yI_n,[0.0,0.0,0.0],...
'Linestyle','None')

text(-11,11,'Από το αριστερό κύκλωμα βραχυκυκλώνοντας την πηγή τάσης και ανοίγοντας την πηγή ρεύματος έχουμε
ότι η αντίσταση Thevenin')
text(-11,10,'είναι  $R_{T1}=R_{1}$ =')
text(-8,10.2,nR1)
text(-7.6,10.2,'Ohm.')
text(-6.5,10,'Το ρεύμα βραχυκύκλωσης των άκρων c, d είναι  $I_{N1}=(V_{1}/R_{1})+J_{1}$ =')
text(5.0,10.2,nIN1)
text(5.4,10.2,'Α. Άρα η τάση Thevenin θα είναι')
text(-11,9,' $V_{T1}=I_{N1}R_{T1}$ =')
text(-8.5,9.2,nVT1)
text(-8.0,9.2,'Volt.')

text(x07-1.0,y07+1.0,' $V_{1}$ ','Color',[0.0,0.2,0.9])
text(x01+0.5,y01-1.5,' $R_{1}$ ','Color',[0.9,0.2,0.0])
text(x09+0.85,y09,' $J_{1}$ ','Color',[0.0,0.2,0.9])
text(-2.0,y02+1.0,' $C$ ','Color',[0.9,0.0,0.0])
text(-2.0,y01-1.0,' $d$ ','Color',[0.9,0.0,0.0])
text(x07-1.0+10.0,y07+1.0,' $V_{1}$ ','Color',[0.0,0.2,0.9])
text(x01+0.5+10.0,y01-1.5,' $R_{1}$ ','Color',[0.9,0.2,0.0])
text(x09+0.85+10.0,y09,' $J_{1}$ ','Color',[0.0,0.2,0.9])
text(-2.0+10.0,y02+1.0,' $C$ ','Color',[0.9,0.0,0.0])
text(-2.0+10.0,y01-1.0,' $d$ ','Color',[0.9,0.0,0.0])
text(x07-1.0+10.0+7.5,y07+1.0,' $I_{N1}$ ','Color',[0.0,0.2,0.9])

axis([-12,12,-12,12])
axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
elseif (snmeio==3)
axes(handles.axes1);
cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,9,9];

x01=-8.0;
y01=-5;
th1=0;

x02=-8.0;
y02=5;
th2=0;

```

```

xres_21=x02+[0.40*sin(th2),0.40*sin(th2)+1.2*cos(th2),...
-0.40*sin(th2)+1.2*cos(th2),-0.40*sin(th2)];
yres_21=y02+[-0.40*cos(th2),-0.40*cos(th2)+1.2*sin(th2),...
0.40*cos(th2)+1.2*sin(th2),0.40*cos(th2)];

xres_22=x02+[-0.05*sin(th2),-0.05*sin(th2)+0.25*cos(th2),...
-0.40*sin(th2)+0.3*cos(th2),...
0.25*sin(th2)+0.45*cos(th2),...
-0.40*sin(th2)+0.6*cos(th2),...
0.25*sin(th2)+0.75*cos(th2),...
-0.40*sin(th2)+0.9*cos(th2),...
-0.05*sin(th2)+0.95*cos(th2),...
-0.05*sin(th2)+1.2*cos(th2),...
0.05*sin(th2)+1.2*cos(th2),...
0.05*sin(th2)+0.95*cos(th2),...
-0.25*sin(th2)+0.9*cos(th2),...
0.40*sin(th2)+0.75*cos(th2),...
-0.25*sin(th2)+0.6*cos(th2),...
0.40*sin(th2)+0.45*cos(th2),...
-0.25*sin(th2)+0.3*cos(th2),...
0.05*sin(th2)+0.25*cos(th2),...
0.05*sin(th2)];
yres_22=y02+[0.05*cos(th2),0.05*cos(th2)+0.25*sin(th2),...
0.40*cos(th2)+0.3*sin(th2),...
-0.25*cos(th2)+0.45*sin(th2),...
0.40*cos(th2)+0.6*sin(th2),...
-0.250*cos(th2)+0.75*sin(th2),...
0.40*cos(th2)+0.9*sin(th2),...
0.05*cos(th2)+0.95*sin(th2),...
0.05*cos(th2)+1.2*sin(th2),...
-0.05*cos(th2)+1.2*sin(th2),...
-0.05*cos(th2)+0.95*sin(th2),...
0.25*cos(th2)+0.9*sin(th2),...
-0.40*cos(th2)+0.75*sin(th2),...
0.25*cos(th2)+0.6*sin(th2),...
-0.40*cos(th2)+0.45*sin(th2),...
0.25*cos(th2)+0.3*sin(th2),...
-0.05*cos(th2)+0.25*sin(th2),...
-0.05*cos(th2)];

x03=-3.0;
y03=2.5;
th3=pi/2;

xres_31=x03+[0.25*sin(th3),0.25*sin(th3)+1.6*cos(th3),...
-0.25*sin(th3)+1.6*cos(th3),-0.25*sin(th3)];
yres_31=y03+[-0.25*cos(th3),-0.25*cos(th3)+1.6*sin(th3),...
0.25*cos(th3)+1.6*sin(th3),0.25*cos(th3)];

xres_32=x03+[-0.03*sin(th3),-0.03*sin(th3)+0.33*cos(th3),...
-0.25*sin(th3)+0.4*cos(th3),...
0.10*sin(th3)+0.6*cos(th3),...
-0.25*sin(th3)+0.8*cos(th3),...
0.10*sin(th3)+1.0*cos(th3),...
-0.25*sin(th3)+1.2*cos(th3),...
-0.03*sin(th3)+1.27*cos(th3),...
-0.03*sin(th3)+1.6*cos(th3),...
0.03*sin(th3)+1.6*cos(th3),...
0.03*sin(th3)+1.27*cos(th3),...
-0.10*sin(th3)+1.2*cos(th3),...
0.25*sin(th3)+1.0*cos(th3),...
-0.10*sin(th3)+0.8*cos(th3),...
0.25*sin(th3)+0.6*cos(th3),...
-0.10*sin(th3)+0.4*cos(th3),...
0.03*sin(th3)+0.33*cos(th3),...
0.03*sin(th3)];
yres_32=y03+[0.03*cos(th3),0.03*cos(th3)+0.33*sin(th3),...
0.25*cos(th3)+0.4*sin(th3),...
-0.10*cos(th3)+0.6*sin(th3),...
0.25*cos(th3)+0.8*sin(th3),...
-0.10*cos(th3)+1.0*sin(th3),...
0.25*cos(th3)+1.2*sin(th3),...
0.03*cos(th3)+1.27*sin(th3),...
0.03*cos(th3)+1.6*sin(th3),...
-0.03*cos(th3)+1.6*sin(th3),...
-0.03*cos(th3)+1.27*sin(th3),...
0.10*cos(th3)+1.2*sin(th3),...
-0.25*cos(th3)+1.0*sin(th3),...
0.10*cos(th3)+0.8*sin(th3),...
-0.25*cos(th3)+0.6*sin(th3),...
-0.25*cos(th3)+0.4*sin(th3),...

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```

0.10*cos(th3)+0.4*sin(th3),...
-0.03*cos(th3)+0.33*sin(th3),...
-0.03*cos(th3)];

x04=-3.0;
y04=-2.5;
th4=pi/2;

xres_41=x04+[0.25*sin(th4),0.25*sin(th4)+1.6*cos(th4),...
-0.25*sin(th4)+1.6*cos(th4),-0.25*sin(th4)];
yres_41=y04+[-0.25*cos(th4),-0.25*cos(th4)+1.6*sin(th4),...
0.25*cos(th4)+1.6*sin(th4),0.25*cos(th4)];

xres_42=x04+[-0.03*sin(th4),-0.03*sin(th4)+0.33*cos(th4),...
-0.25*sin(th4)+0.4*cos(th4),...
0.10*sin(th4)+0.6*cos(th4),...
-0.25*sin(th4)+0.8*cos(th4),...
0.10*sin(th4)+1.0*cos(th4),...
-0.25*sin(th4)+1.2*cos(th4),...
-0.03*sin(th4)+1.27*cos(th4),...
-0.03*sin(th4)+1.6*cos(th4),...
0.03*sin(th4)+1.6*cos(th4),...
0.03*sin(th4)+1.27*cos(th4),...
-0.10*sin(th4)+1.2*cos(th4),...
0.25*sin(th4)+1.0*cos(th4),...
-0.10*sin(th4)+0.8*cos(th4),...
0.25*sin(th4)+0.6*cos(th4),...
-0.10*sin(th4)+0.4*cos(th4),...
0.03*sin(th4)+0.33*cos(th4),...
0.03*sin(th4)];
yres_42=y04+[0.03*cos(th4),0.03*cos(th4)+0.33*sin(th4),...
0.25*cos(th4)+0.4*sin(th4),...
-0.10*cos(th4)+0.6*sin(th4),...
0.25*cos(th4)+0.8*sin(th4),...
-0.10*cos(th4)+1.0*sin(th4),...
0.25*cos(th4)+1.2*sin(th4),...
0.03*cos(th4)+1.27*sin(th4),...
0.03*cos(th4)+1.6*sin(th4),...
-0.03*cos(th4)+1.6*sin(th4),...
-0.03*cos(th4)+1.27*sin(th4),...
0.10*cos(th4)+1.2*sin(th4),...
-0.25*cos(th4)+1.0*sin(th4),...
0.10*cos(th4)+0.8*sin(th4),...
-0.25*cos(th4)+0.6*sin(th4),...
0.10*cos(th4)+0.4*sin(th4),...
-0.03*cos(th4)+0.33*sin(th4),...
-0.03*cos(th4)];

x05=1.0;
y05=0.5;
th5=0;

xres_51=x05+[0.40*sin(th5),0.40*sin(th5)+1.2*cos(th5),...
-0.40*sin(th5)+1.2*cos(th5),-0.40*sin(th5)];
yres_51=y05+[-0.40*cos(th5),-0.40*cos(th5)+1.2*sin(th5),...
0.40*cos(th5)+1.2*sin(th5),0.40*cos(th5)];

xres_52=x05+[-0.05*sin(th5),-0.05*sin(th5)+0.25*cos(th5),...
-0.40*sin(th5)+0.3*cos(th5),...
0.25*sin(th5)+0.45*cos(th5),...
-0.40*sin(th5)+0.6*cos(th5),...
0.25*sin(th5)+0.75*cos(th5),...
-0.40*sin(th5)+0.9*cos(th5),...
-0.05*sin(th5)+0.95*cos(th5),...
-0.05*sin(th5)+1.2*cos(th5),...
0.05*sin(th5)+1.2*cos(th5),...
0.05*sin(th5)+0.95*cos(th5),...
-0.25*sin(th5)+0.9*cos(th5),...
0.40*sin(th5)+0.75*cos(th5),...
-0.25*sin(th5)+0.6*cos(th5),...
0.40*sin(th5)+0.45*cos(th5),...
-0.25*sin(th5)+0.3*cos(th5),...
0.05*sin(th5)+0.25*cos(th5),...
0.05*sin(th5)];
yres_52=y05+[0.05*cos(th5),0.05*cos(th5)+0.25*sin(th5),...
0.40*cos(th5)+0.3*sin(th5),...
-0.25*cos(th5)+0.45*sin(th5),...
0.40*cos(th5)+0.6*sin(th5),...
-0.250*cos(th5)+0.75*sin(th5),...
0.40*cos(th5)+0.9*sin(th5),...

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0.05*cos(th5)+0.95*sin(th5),...
0.05*cos(th5)+1.2*sin(th5),...
-0.05*cos(th5)+1.2*sin(th5),...
-0.05*cos(th5)+0.95*sin(th5),...
0.25*cos(th5)+0.9*sin(th5),...
-0.40*cos(th5)+0.75*sin(th5),...
0.25*cos(th5)+0.6*sin(th5),...
-0.40*cos(th5)+0.45*sin(th5),...
0.25*cos(th5)+0.3*sin(th5),...
-0.05*cos(th5)+0.25*sin(th5),...
-0.05*cos(th5)];

x06=6.0;
y06=-2.5;
th6=pi/2;

xres_61=x06+[0.25*sin(th6),0.25*sin(th6)+1.6*cos(th6),...
-0.25*sin(th6)+1.6*cos(th6),-0.25*sin(th6)];
yres_61=y06+[-0.25*cos(th6),-0.25*cos(th6)+1.6*sin(th6),...
0.25*cos(th6)+1.6*sin(th6),0.25*cos(th6)];

xres_62=x06+[-0.03*sin(th6),-0.03*sin(th6)+0.33*cos(th6),...
-0.25*sin(th6)+0.4*cos(th6),...
0.10*sin(th6)+0.6*cos(th6),...
-0.25*sin(th6)+0.8*cos(th6),...
0.10*sin(th6)+1.0*cos(th6),...
-0.25*sin(th6)+1.2*cos(th6),...
-0.03*sin(th6)+1.27*cos(th6),...
-0.03*sin(th6)+1.6*cos(th6),...
0.03*sin(th6)+1.6*cos(th6),...
0.03*sin(th6)+1.27*cos(th6),...
-0.10*sin(th6)+1.2*cos(th6),...
0.25*sin(th6)+1.0*cos(th6),...
-0.10*sin(th6)+0.8*cos(th6),...
0.25*sin(th6)+0.6*cos(th6),...
-0.10*sin(th6)+0.4*cos(th6),...
0.03*sin(th6)+0.33*cos(th6),...
0.03*sin(th6)];
yres_62=y06+[0.03*cos(th6),0.03*cos(th6)+0.33*sin(th6),...
0.25*cos(th6)+0.4*sin(th6),...
-0.10*cos(th6)+0.6*sin(th6),...
0.25*cos(th6)+0.8*sin(th6),...
-0.10*cos(th6)+1.0*sin(th6),...
0.25*cos(th6)+1.2*sin(th6),...
0.03*cos(th6)+1.27*sin(th6),...
0.03*cos(th6)+1.6*sin(th6),...
-0.03*cos(th6)+1.6*sin(th6),...
-0.03*cos(th6)+1.27*sin(th6),...
0.10*cos(th6)+1.2*sin(th6),...
-0.25*cos(th6)+1.0*sin(th6),...
0.10*cos(th6)+0.8*sin(th6),...
-0.25*cos(th6)+0.6*sin(th6),...
0.10*cos(th6)+0.4*sin(th6),...
-0.03*cos(th6)+0.33*sin(th6),...
-0.03*cos(th6)];

x07=-9.5;
y07=0;

xv1_1=x07+[-1.0,1.0,1.0,-1.0];
yv1_1=y07+[-0.05,-0.05,0.05,0.05]+0.3;

xv1_2=x07+[-0.4,0.4,0.4,-0.4];
yv1_2=y07+[-0.1,-0.1,0.1,0.1]-0.1;

x08=6.0;
y08=2.5;
phi8=0:0.01:2*pi;

xI1_1=x08+0.6*cos(phi8);
yI1_1=y08+0.9*sin(phi8);

xI1_2=x08+0.55*cos(phi8);
yI1_2=y08+0.85*sin(phi8);

xI1_3=x08+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI1_3=y08+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

```

```

x09=-6.0;
y09=0.5;
phi9=0:0.01:2*pi;

xcable1=[-9.5,-9.5,-8,-8];
ycable1=y02+[0.1,-0.1,-0.1,0.1];

xcable2=[-9.55,-9.45,-9.45,-9.55];
ycable2=[y02+0.1,y02+0.1,y07+0.35,y07+0.35];

xcable3=[-9.55,-9.45,-9.45,-9.55];
ycable3=[y01,y01,y07-0.2,y07-0.2];

xcable4=[-9.5,-9.5,x01,x01];
ycable4=y01+[0.1,-0.1,-0.1,0.1];

xcable5=[9.5,9.5,x01,x01];
ycable5=y01+[0.1,-0.1,-0.1,0.1];

xcable6=[9.5,9.5,x02+1.2,x02+1.2];
ycable6=y02+[0.1,-0.1,-0.1,0.1];

xcable7=[-9.55,-9.45,-9.45,-9.55]+6.5;
ycable7=[y02,y02,y03+1.6,y03+1.6];

xcable8=[-9.55,-9.45,-9.45,-9.55]+6.5;
ycable8=[y04+1.6,y04+1.6,y03,y03];

xcable9=[-9.55,-9.45,-9.45,-9.55]+6.5;
ycable9=[y04,y04,y01,y01];

xcable10=[-3.0,-3.0,x05,x05];
ycable10=y05+[0.1,-0.1,-0.1,0.1];

xcable11=[x06,x06,x05+1.2,x05+1.2];
ycable11=y05+[0.1,-0.1,-0.1,0.1];

xcable12=[-9.55,-9.45,-9.45,-9.55]+15.5;
ycable12=[y02,y02,y08+0.9,y08+0.9];

xcable13=[-9.55,-9.45,-9.45,-9.55]+15.5;
ycable13=[y06+1.6,y06+1.6,y08-0.9,y08-0.9];

xcable14=[-9.55,-9.45,-9.45,-9.55]+15.5;
ycable14=[y06,y06,y01,y01];

xcable15=[-9.5,-9.5,x09,x09];
ycable15=y02+[0.1,-0.1,-0.1,0.1]-2.0;

xcable16=[-9.55,-9.45,-9.45,-9.55]+3.5;
ycable16=[y02-1.9,y02-1.9,y09+0.9,y09+0.9];

xcable17=[-9.55,-9.45,-9.45,-9.55]+3.5;
ycable17=[y01,y01,y09-0.9,y09-0.9];

xI_1=x02+2.5+[0.0,0.0,1.0,1.0,1.5,1.0,1.0];
yI_1=y02+[0.1,-0.1,-0.1,-0.3,0.0,0.3,0.1];

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_21,yres_21,[1.0,1.0,1.0],...
xres_22,yres_22,[0.0,0.0,0.0],...
xres_31,yres_31,[1.0,1.0,1.0],...
xres_32,yres_32,[0.0,0.0,0.0],...
xres_41,yres_41,[1.0,1.0,1.0],...
xres_42,yres_42,[0.0,0.0,0.0],...
xres_51,yres_51,[1.0,1.0,1.0],...
xres_52,yres_52,[0.0,0.0,0.0],...
xres_61,yres_61,[1.0,1.0,1.0],...
xres_62,yres_62,[0.0,0.0,0.0],...
xV1_1,yV1_1,[0.0,0.0,0.0],...
xV1_2,yV1_2,[0.0,0.0,0.0],...
xI1_1,yI1_1,[0.0,0.0,0.0],...
xI1_2,yI1_2,[1.0,1.0,1.0],...
xI1_3,yI1_3,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...

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xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
xcable10,ycable10,[0.8,0.6,0.2],...
xcable11,ycable11,[0.8,0.6,0.2],...
xcable12,ycable12,[0.8,0.6,0.2],...
xcable13,ycable13,[0.8,0.6,0.2],...
xcable14,ycable14,[0.8,0.6,0.2],...
xI_1,yI_1,[0.0,0.0,0.0],...
    'LineStyle','None')

text(-11,11,'Συνεπώς το αρχικό κύκλωμα γίνεται τώρα (R_{12}=R_{1}+R_{2})=')
    text(-0.8,11.2,nR12)
text(-0.3,11.2,'Ohm). Μετασχηματίζουμε το τρίγωνο των αντιστάσεων R_{4}, R_{5}, R_{6}')
    text(-11,10,'σε αστέρα. Θα έχουμε')
    text(9.7,y02,'a','Color',[0.9,0.0,0.0])
    text(9.7,y01,'b','Color',[0.9,0.0,0.0])
    text(x02+0.5,y02+1.5,'R_{12}','Color',[0.9,0.2,0.0])
    text(x03+0.5,y03+0.75,'R_3','Color',[0.9,0.2,0.0])
    text(x04+0.5,y04+0.75,'R_4','Color',[0.9,0.2,0.0])
    text(x05+0.5,y05-1.5,'R_5','Color',[0.9,0.2,0.0])
    text(x06+0.5,y06+0.75,'R_6','Color',[0.9,0.2,0.0])
    text(x07-0.75,y07+1.0,'V_{T1}','Color',[0.0,0.2,0.9])
    text(x08+0.85,y08,'2I_1','Color',[0.0,0.2,0.9])
    text(x02+3.0,y02-1.0,'I_1','Color',[0.0,0.2,0.9])

    axis([-12,12,-12,12])
    axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
elseif (snmeio==4)
axes(handles.axes1);
cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=-12,12,12,-12];
y_back=-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,9,9];

x01=-8.0;
y01=-5;
th1=0;

x02=-8.0;
y02=5;
th2=0;

xres_21=x02+[0.40*sin(th2),0.40*sin(th2)+1.2*cos(th2),...
-0.40*sin(th2)+1.2*cos(th2),-0.40*sin(th2)];
yres_21=y02+[-0.40*cos(th2),-0.40*cos(th2)+1.2*sin(th2),...
0.40*cos(th2)+1.2*sin(th2),0.40*cos(th2)];

xres_22=x02+[-0.05*sin(th2),-0.05*sin(th2)+0.25*cos(th2),...
-0.40*sin(th2)+0.3*cos(th2),...
0.25*sin(th2)+0.45*cos(th2),...
-0.40*sin(th2)+0.6*cos(th2),...
0.25*sin(th2)+0.75*cos(th2),...
-0.40*sin(th2)+0.9*cos(th2),...
-0.05*sin(th2)+0.95*cos(th2),...
-0.05*sin(th2)+1.2*cos(th2),...
0.05*sin(th2)+1.2*cos(th2),...
0.05*sin(th2)+0.95*cos(th2),...
-0.25*sin(th2)+0.9*cos(th2),...
0.40*sin(th2)+0.75*cos(th2),...
-0.25*sin(th2)+0.6*cos(th2),...
0.40*sin(th2)+0.45*cos(th2),...
-0.25*sin(th2)+0.3*cos(th2),...
0.05*sin(th2)+0.25*cos(th2),...
0.05*sin(th2)];
yres_22=y02+[0.05*cos(th2),0.05*cos(th2)+0.25*sin(th2),...
0.40*cos(th2)+0.3*sin(th2),...
-0.25*cos(th2)+0.45*sin(th2),...
0.40*cos(th2)+0.6*sin(th2),...
-0.250*cos(th2)+0.75*sin(th2),...
0.40*cos(th2)+0.9*sin(th2),...
0.05*cos(th2)+0.95*sin(th2),...
0.05*cos(th2)+1.2*sin(th2),...

```

```

-0.05*cos(th2)+1.2*sin(th2),...
-0.05*cos(th2)+0.95*sin(th2),...
0.25*cos(th2)+0.9*sin(th2),...
-0.40*cos(th2)+0.75*sin(th2),...
0.25*cos(th2)+0.6*sin(th2),...
-0.40*cos(th2)+0.45*sin(th2),...
0.25*cos(th2)+0.3*sin(th2),...
-0.05*cos(th2)+0.25*sin(th2),...
-0.05*cos(th2)];

x03=-3.0;
y03=2.5;
th3=pi/2;

xres_31=x03+[0.25*sin(th3),0.25*sin(th3)+1.6*cos(th3),...
-0.25*sin(th3)+1.6*cos(th3),-0.25*sin(th3)];
yres_31=y03+[-0.25*cos(th3),-0.25*cos(th3)+1.6*sin(th3),...
0.25*cos(th3)+1.6*sin(th3),0.25*cos(th3)];

xres_32=x03+[-0.03*sin(th3),-0.03*sin(th3)+0.33*cos(th3),...
-0.25*sin(th3)+0.4*cos(th3),...
0.10*sin(th3)+0.6*cos(th3),...
-0.25*sin(th3)+0.8*cos(th3),...
0.10*sin(th3)+1.0*cos(th3),...
-0.25*sin(th3)+1.2*cos(th3),...
-0.03*sin(th3)+1.27*cos(th3),...
-0.03*sin(th3)+1.6*cos(th3),...
0.03*sin(th3)+1.6*cos(th3),...
0.03*sin(th3)+1.27*cos(th3),...
-0.10*sin(th3)+1.2*cos(th3),...
0.25*sin(th3)+1.0*cos(th3),...
-0.10*sin(th3)+0.8*cos(th3),...
0.25*sin(th3)+0.6*cos(th3),...
-0.10*sin(th3)+0.4*cos(th3),...
0.03*sin(th3)+0.33*cos(th3),...
0.03*sin(th3)];
yres_32=y03+[0.03*cos(th3),0.03*cos(th3)+0.33*sin(th3),...
0.25*cos(th3)+0.4*sin(th3),...
-0.10*cos(th3)+0.6*sin(th3),...
0.25*cos(th3)+0.8*sin(th3),...
-0.10*cos(th3)+1.0*sin(th3),...
0.25*cos(th3)+1.2*sin(th3),...
0.03*cos(th3)+1.27*sin(th3),...
0.03*cos(th3)+1.6*sin(th3),...
-0.03*cos(th3)+1.6*sin(th3),...
-0.03*cos(th3)+1.27*sin(th3),...
0.10*cos(th3)+1.2*sin(th3),...
-0.25*cos(th3)+1.0*sin(th3),...
0.10*cos(th3)+0.8*sin(th3),...
-0.25*cos(th3)+0.6*sin(th3),...
0.10*cos(th3)+0.4*sin(th3),...
-0.03*cos(th3)+0.33*sin(th3),...
-0.03*cos(th3)];

x04=1.5;
y04=-2.5;
th4=pi/2;

xres_41=x04+[0.25*sin(th4),0.25*sin(th4)+1.6*cos(th4),...
-0.25*sin(th4)+1.6*cos(th4),-0.25*sin(th4)];
yres_41=y04+[-0.25*cos(th4),-0.25*cos(th4)+1.6*sin(th4),...
0.25*cos(th4)+1.6*sin(th4),0.25*cos(th4)];

xres_42=x04+[-0.03*sin(th4),-0.03*sin(th4)+0.33*cos(th4),...
-0.25*sin(th4)+0.4*cos(th4),...
0.10*sin(th4)+0.6*cos(th4),...
-0.25*sin(th4)+0.8*cos(th4),...
0.10*sin(th4)+1.0*cos(th4),...
-0.25*sin(th4)+1.2*cos(th4),...
-0.03*sin(th4)+1.27*cos(th4),...
-0.03*sin(th4)+1.6*cos(th4),...
0.03*sin(th4)+1.6*cos(th4),...
0.03*sin(th4)+1.27*cos(th4),...
-0.10*sin(th4)+1.2*cos(th4),...
0.25*sin(th4)+1.0*cos(th4),...
-0.10*sin(th4)+0.8*cos(th4),...
0.25*sin(th4)+0.6*cos(th4),...
-0.10*sin(th4)+0.4*cos(th4),...
0.03*sin(th4)+0.33*cos(th4),...
0.03*sin(th4)];
yres_42=y04+[0.03*cos(th4),0.03*cos(th4)+0.33*sin(th4),...

```

```

0.25*cos(th4)+0.4*sin(th4),...
-0.10*cos(th4)+0.6*sin(th4),...
0.25*cos(th4)+0.8*sin(th4),...
-0.10*cos(th4)+1.0*sin(th4),...
0.25*cos(th4)+1.2*sin(th4),...
0.03*cos(th4)+1.27*sin(th4),...
0.03*cos(th4)+1.6*sin(th4),...
-0.03*cos(th4)+1.6*sin(th4),...
-0.03*cos(th4)+1.27*sin(th4),...
0.10*cos(th4)+1.2*sin(th4),...
-0.25*cos(th4)+1.0*sin(th4),...
0.10*cos(th4)+0.8*sin(th4),...
-0.25*cos(th4)+0.6*sin(th4),...
0.10*cos(th4)+0.4*sin(th4),...
-0.03*cos(th4)+0.33*sin(th4),...
-0.03*cos(th4)];

x05=-1.0;
y05=0.5;
th5=0;

xres_51=x05+[0.40*sin(th5),0.40*sin(th5)+1.2*cos(th5),...
-0.40*sin(th5)+1.2*cos(th5),-0.40*sin(th5)];
yres_51=y05+[-0.40*cos(th5),-0.40*cos(th5)+1.2*sin(th5),...
0.40*cos(th5)+1.2*sin(th5),0.40*cos(th5)];

xres_52=x05+[-0.05*sin(th5),-0.05*sin(th5)+0.25*cos(th5),...
-0.40*sin(th5)+0.3*cos(th5),...
0.25*sin(th5)+0.45*cos(th5),...
-0.40*sin(th5)+0.6*cos(th5),...
0.25*sin(th5)+0.75*cos(th5),...
-0.40*sin(th5)+0.9*cos(th5),...
-0.05*sin(th5)+0.95*cos(th5),...
-0.05*sin(th5)+1.2*cos(th5),...
0.05*sin(th5)+1.2*cos(th5),...
0.05*sin(th5)+0.95*cos(th5),...
-0.25*sin(th5)+0.9*cos(th5),...
0.40*sin(th5)+0.75*cos(th5),...
-0.25*sin(th5)+0.6*cos(th5),...
0.40*sin(th5)+0.45*cos(th5),...
-0.25*sin(th5)+0.3*cos(th5),...
0.05*sin(th5)+0.25*cos(th5),...
0.05*sin(th5)];
yres_52=y05+[0.05*cos(th5),0.05*cos(th5)+0.25*sin(th5),...
0.40*cos(th5)+0.3*sin(th5),...
-0.25*cos(th5)+0.45*sin(th5),...
0.40*cos(th5)+0.6*sin(th5),...
-0.250*cos(th5)+0.75*sin(th5),...
0.40*cos(th5)+0.9*sin(th5),...
0.05*cos(th5)+0.95*sin(th5),...
0.05*cos(th5)+1.2*sin(th5),...
-0.05*cos(th5)+1.2*sin(th5),...
-0.05*cos(th5)+0.95*sin(th5),...
0.25*cos(th5)+0.9*sin(th5),...
-0.40*cos(th5)+0.75*sin(th5),...
0.25*cos(th5)+0.6*sin(th5),...
-0.40*cos(th5)+0.45*sin(th5),...
0.25*cos(th5)+0.3*sin(th5),...
-0.05*cos(th5)+0.25*sin(th5),...
-0.05*cos(th5)];

x05_1=3.0;
y05=0.5;
th5=0;

xres_51_1=x05_1+[0.40*sin(th5),0.40*sin(th5)+1.2*cos(th5),...
-0.40*sin(th5)+1.2*cos(th5),-0.40*sin(th5)];
yres_51_1=y05+[-0.40*cos(th5),-0.40*cos(th5)+1.2*sin(th5),...
0.40*cos(th5)+1.2*sin(th5),0.40*cos(th5)];

xres_52_1=x05_1+[-0.05*sin(th5),-0.05*sin(th5)+0.25*cos(th5),...
-0.40*sin(th5)+0.3*cos(th5),...
0.25*sin(th5)+0.45*cos(th5),...
-0.40*sin(th5)+0.6*cos(th5),...
0.25*sin(th5)+0.75*cos(th5),...
-0.40*sin(th5)+0.9*cos(th5),...
-0.05*sin(th5)+0.95*cos(th5),...
-0.05*sin(th5)+1.2*cos(th5),...
0.05*sin(th5)+1.2*cos(th5),...
0.05*sin(th5)+0.95*cos(th5),...

```



```

-0.25*sin(th5)+0.9*cos(th5),...
0.40*sin(th5)+0.75*cos(th5),...
-0.25*sin(th5)+0.6*cos(th5),...
0.40*sin(th5)+0.45*cos(th5),...
-0.25*sin(th5)+0.3*cos(th5),...
0.05*sin(th5)+0.25*cos(th5),...
0.05*sin(th5)];
yres_52_1=y05+[0.05*cos(th5),0.05*cos(th5)+0.25*sin(th5),...
0.40*cos(th5)+0.3*sin(th5),...
-0.25*cos(th5)+0.45*sin(th5),...
0.40*cos(th5)+0.6*sin(th5),...
-0.25*cos(th5)+0.75*sin(th5),...
0.40*cos(th5)+0.9*sin(th5),...
0.05*cos(th5)+0.95*sin(th5),...
0.05*cos(th5)+1.2*sin(th5),...
-0.05*cos(th5)+1.2*sin(th5),...
-0.05*cos(th5)+0.95*sin(th5),...
0.25*cos(th5)+0.9*sin(th5),...
-0.40*cos(th5)+0.75*sin(th5),...
0.25*cos(th5)+0.6*sin(th5),...
-0.40*cos(th5)+0.45*sin(th5),...
0.25*cos(th5)+0.3*sin(th5),...
-0.05*cos(th5)+0.25*sin(th5),...
-0.05*cos(th5)];

x06=6.0;
y06=-2.5;
th6=pi/2;

x07=-9.5;
y07=0;

xV1_1=x07+[-1.0,1.0,1.0,-1.0];
yV1_1=y07+[-0.05,-0.05,0.05,0.05]+0.3;

xV1_2=x07+[-0.4,0.4,0.4,-0.4];
yV1_2=y07+[-0.1,-0.1,0.1,0.1]-0.1;

x08=6.0;
y08=2.5;
phi8=0:0.01:2*pi;

xI1_1=x08+0.6*cos(phi8);
yI1_1=y08+0.9*sin(phi8);

xI1_2=x08+0.55*cos(phi8);
yI1_2=y08+0.85*sin(phi8);

xI1_3=x08+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI1_3=y08+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

x09=-6.0;
y09=0.5;
phi9=0:0.01:2*pi;

xcable1=[-9.5,-9.5,-8,-8];
ycable1=y02+[0.1,-0.1,-0.1,0.1];

xcable2=[-9.55,-9.45,-9.45,-9.55];
ycable2=[y02+0.1,y02+0.1,y07+0.35,y07+0.35];

xcable3=[-9.55,-9.45,-9.45,-9.55];
ycable3=[y01,y01,y07-0.2,y07-0.2];

xcable4=[-9.5,-9.5,x01,x01];
ycable4=y01+[0.1,-0.1,-0.1,0.1];

xcable5=[9.5,9.5,x01,x01];
ycable5=y01+[0.1,-0.1,-0.1,0.1];

xcable6=[9.5,9.5,x02+1.2,x02+1.2];
ycable6=y02+[0.1,-0.1,-0.1,0.1];

xcable7=[-9.55,-9.45,-9.45,-9.55]+6.5;
ycable7=[y02,y02,y03+1.6,y03+1.6];

xcable8=[-9.55,-9.45,-9.45,-9.55]+6.5;
ycable8=[y05-0.1,y05-0.1,y03,y03];

```

```

xcable9=[-9.55,-9.45,-9.45,-9.55]+6.5+3.0+1.5;
ycable9=[y04,y04,y01,y01];

xcable9_1=[-9.55,-9.45,-9.45,-9.55]+6.5+3.0+1.5;
ycable9_1=[y04+1.6,y04+1.6,y05-0.1,y05-0.1];

xcable10=[-3.0,-3.0,x05,x05];
ycable10=y05+[0.1,-0.1,-0.1,0.1];

xcable11=[x05_1,x05_1,x05+1.2,x05+1.2];
ycable11=y05+[0.1,-0.1,-0.1,0.1];

xcable11_1=[x06,x06,x05_1+1.2,x05_1+1.2];
ycable11_1=y05+[0.1,-0.1,-0.1,0.1];

xcable12=[-9.55,-9.45,-9.45,-9.55]+15.5;
ycable12=[y02,y02,y08+0.9,y08+0.9];

xcable13=[-9.55,-9.45,-9.45,-9.55]+15.5;
ycable13=[y05-0.1,y05-0.1,y08-0.9,y08-0.9];

xcable15=[-9.5,-9.5,x09,x09];
ycable15=y02+[0.1,-0.1,-0.1,0.1]-2.0;

xcable16=[-9.55,-9.45,-9.45,-9.55]+3.5;
ycable16=[y02-1.9,y02-1.9,y09+0.9,y09+0.9];

xcable17=[-9.55,-9.45,-9.45,-9.55]+3.5;
ycable17=[y01,y01,y09-0.9,y09-0.9];

xI_1=x02+2.5+[0.0,0.0,1.0,1.0,1.5,1.0,1.0];
yI_1=y02+[0.1,-0.1,-0.1,-0.3,0.0,0.3,0.1];

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_21,yres_21,[1.0,1.0,1.0],...
xres_22,yres_22,[0.0,0.0,0.0],...
xres_31,yres_31,[1.0,1.0,1.0],...
xres_32,yres_32,[0.0,0.0,0.0],...
xres_41,yres_41,[1.0,1.0,1.0],...
xres_42,yres_42,[0.0,0.0,0.0],...
xres_51,yres_51,[1.0,1.0,1.0],...
xres_52,yres_52,[0.0,0.0,0.0],...
xres_51_1,yres_51_1,[1.0,1.0,1.0],...
xres_52_1,yres_52_1,[0.0,0.0,0.0],...
xV1_1,yV1_1,[0.0,0.0,0.0],...
xV1_2,yV1_2,[0.0,0.0,0.0],...
xI1_1,yI1_1,[0.0,0.0,0.0],...
xI1_2,yI1_2,[1.0,1.0,1.0],...
xI1_3,yI1_3,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
xcable9_1,ycable9_1,[0.8,0.6,0.2],...
xcable10,ycable10,[0.8,0.6,0.2],...
xcable11,ycable11,[0.8,0.6,0.2],...
xcable11_1,ycable11_1,[0.8,0.6,0.2],...
xcable12,ycable12,[0.8,0.6,0.2],...
xcable13,ycable13,[0.8,0.6,0.2],...
xI_1,yI_1,[0.0,0.0,0.0],...
'Linestyle','None')

text(-11,11,' $\theta_a \acute{\epsilon}\chi\omicron\upsilon\mu\epsilon R_{\{45\}}=R_{\{4\}}R_{\{5\}}/(R_{\{4\}}+R_{\{5\}}+R_{\{6\}})='$ )
text(-4.5,11.2,nR45)
text(-3.8,11.0,'Ohm,  $R_{\{46\}}=R_{\{4\}}R_{\{6\}}/(R_{\{4\}}+R_{\{5\}}+R_{\{6\}})='$ )
text(2.0,11.2,nR46)
text(2.4,11.0,'Ohm,  $R_{\{56\}}=R_{\{5\}}R_{\{6\}}/(R_{\{4\}}+R_{\{5\}}+R_{\{6\}})='$ )
text(8.2,11.2,nR56)
text(9.1,11.2,'Ohm.')

text(-11,10,'H αντίσταση  $R_{\{56\}}$  είναι σε σειρά με την πηγή ρεύματος  $2I_{\{1\}}$  και μπορεί να απαλειφθεί. Άρα θα έχουμε')

text(9.7,y02,'a', 'Color',[0.9,0.0,0.0])

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```

        text(9.7,y01,'b','Color',[0.9,0.0,0.0])
        text(x02+0.5,y02+1.5,'R_{12}','Color',[0.9,0.2,0.0])
        text(x03+0.5,y03+0.75,'R_3','Color',[0.9,0.2,0.0])
        text(x04+0.5,y04+0.75,'R_{46}','Color',[0.9,0.2,0.0])
        text(x05+0.5,y05-1.5,'R_{45}','Color',[0.9,0.2,0.0])
        text(x05+4.5,y05-1.5,'R_{56}','Color',[0.9,0.2,0.0])
        text(x07-0.75,y07+1.0,'V_{T1}','Color',[0.0,0.2,0.9])
        text(x08+0.85,y08,'2I_1','Color',[0.0,0.2,0.9])
        text(x02+3.0,y02-1.0,'I_1','Color',[0.0,0.2,0.9])

        axis([-12,12,-12,12])
        axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
        elseif (snmeio==5)
        axes(handles.axes1);
        cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
        x_back=[-12,12,12,-12];
        y_back=[-12,-12,12,12];

        x_tableau=[-11,11,11,-11];
        y_tableau=[-11,-11,8.5,8.5];

        x01=-8.0;
        y01=-5;
        th1=0;

        x02=-8.0;
        y02=5;
        th2=0;

        xres_21=x02+[0.40*sin(th2),0.40*sin(th2)+1.2*cos(th2),...
        -0.40*sin(th2)+1.2*cos(th2),-0.40*sin(th2)];
        yres_21=y02+[-0.40*cos(th2),-0.40*cos(th2)+1.2*sin(th2),...
        0.40*cos(th2)+1.2*sin(th2),0.40*cos(th2)];

        xres_22=x02+[-0.05*sin(th2),-0.05*sin(th2)+0.25*cos(th2),...
        -0.40*sin(th2)+0.3*cos(th2),...
        0.25*sin(th2)+0.45*cos(th2),...
        -0.40*sin(th2)+0.6*cos(th2),...
        0.25*sin(th2)+0.75*cos(th2),...
        -0.40*sin(th2)+0.9*cos(th2),...
        -0.05*sin(th2)+0.95*cos(th2),...
        -0.05*sin(th2)+1.2*cos(th2),...
        0.05*sin(th2)+1.2*cos(th2),...
        0.05*sin(th2)+0.95*cos(th2),...
        -0.25*sin(th2)+0.9*cos(th2),...
        0.40*sin(th2)+0.75*cos(th2),...
        -0.25*sin(th2)+0.6*cos(th2),...
        0.40*sin(th2)+0.45*cos(th2),...
        -0.25*sin(th2)+0.3*cos(th2),...
        0.05*sin(th2)+0.25*cos(th2),...
        0.05*sin(th2)];
        yres_22=y02+[0.05*cos(th2),0.05*cos(th2)+0.25*sin(th2),...
        0.40*cos(th2)+0.3*sin(th2),...
        -0.25*cos(th2)+0.45*sin(th2),...
        0.40*cos(th2)+0.6*sin(th2),...
        -0.250*cos(th2)+0.75*sin(th2),...
        0.40*cos(th2)+0.9*sin(th2),...
        0.05*cos(th2)+0.95*sin(th2),...
        0.05*cos(th2)+1.2*sin(th2),...
        -0.05*cos(th2)+1.2*sin(th2),...
        -0.05*cos(th2)+0.95*sin(th2),...
        0.25*cos(th2)+0.9*sin(th2),...
        -0.40*cos(th2)+0.75*sin(th2),...
        0.25*cos(th2)+0.6*sin(th2),...
        -0.40*cos(th2)+0.45*sin(th2),...
        0.25*cos(th2)+0.3*sin(th2),...
        -0.05*cos(th2)+0.25*sin(th2),...
        -0.05*cos(th2)];

        x03=-3.0;
        y03=2.5;
        th3=pi/2;

        xres_31=x03+[0.25*sin(th3),0.25*sin(th3)+1.6*cos(th3),...
        -0.25*sin(th3)+1.6*cos(th3),-0.25*sin(th3)];
        yres_31=y03+[-0.25*cos(th3),-0.25*cos(th3)+1.6*sin(th3),...
        0.25*cos(th3)+1.6*sin(th3),0.25*cos(th3)];

```

```

xres_32=x03+[-0.03*sin(th3),-0.03*sin(th3)+0.33*cos(th3),...
-0.25*sin(th3)+0.4*cos(th3),...
0.10*sin(th3)+0.6*cos(th3),...
-0.25*sin(th3)+0.8*cos(th3),...
0.10*sin(th3)+1.0*cos(th3),...
-0.25*sin(th3)+1.2*cos(th3),...
-0.03*sin(th3)+1.27*cos(th3),...
-0.03*sin(th3)+1.6*cos(th3),...
0.03*sin(th3)+1.6*cos(th3),...
0.03*sin(th3)+1.27*cos(th3),...
-0.10*sin(th3)+1.2*cos(th3),...
0.25*sin(th3)+1.0*cos(th3),...
-0.10*sin(th3)+0.8*cos(th3),...
0.25*sin(th3)+0.6*cos(th3),...
-0.10*sin(th3)+0.4*cos(th3),...
0.03*sin(th3)+0.33*cos(th3),...
0.03*sin(th3)];
yres_32=y03+[0.03*cos(th3),0.03*cos(th3)+0.33*sin(th3),...
0.25*cos(th3)+0.4*sin(th3),...
-0.10*cos(th3)+0.6*sin(th3),...
0.25*cos(th3)+0.8*sin(th3),...
-0.10*cos(th3)+1.0*sin(th3),...
0.25*cos(th3)+1.2*sin(th3),...
0.03*cos(th3)+1.27*sin(th3),...
0.03*cos(th3)+1.6*sin(th3),...
-0.03*cos(th3)+1.6*sin(th3),...
-0.03*cos(th3)+1.27*sin(th3),...
0.10*cos(th3)+1.2*sin(th3),...
-0.25*cos(th3)+1.0*sin(th3),...
0.10*cos(th3)+0.8*sin(th3),...
-0.25*cos(th3)+0.6*sin(th3),...
0.10*cos(th3)+0.4*sin(th3),...
-0.03*cos(th3)+0.33*sin(th3),...
-0.03*cos(th3)];

x04=-3.0;
y04=-2.5;
th4=pi/2;

xres_41=x04+[0.25*sin(th4),0.25*sin(th4)+1.6*cos(th4),...
-0.25*sin(th4)+1.6*cos(th4),-0.25*sin(th4)];
yres_41=y04+[-0.25*cos(th4),-0.25*cos(th4)+1.6*sin(th4),...
0.25*cos(th4)+1.6*sin(th4),0.25*cos(th4)];

xres_42=x04+[-0.03*sin(th4),-0.03*sin(th4)+0.33*cos(th4),...
-0.25*sin(th4)+0.4*cos(th4),...
0.10*sin(th4)+0.6*cos(th4),...
-0.25*sin(th4)+0.8*cos(th4),...
0.10*sin(th4)+1.0*cos(th4),...
-0.25*sin(th4)+1.2*cos(th4),...
-0.03*sin(th4)+1.27*cos(th4),...
-0.03*sin(th4)+1.6*cos(th4),...
0.03*sin(th4)+1.6*cos(th4),...
0.03*sin(th4)+1.27*cos(th4),...
-0.10*sin(th4)+1.2*cos(th4),...
0.25*sin(th4)+1.0*cos(th4),...
-0.10*sin(th4)+0.8*cos(th4),...
0.25*sin(th4)+0.6*cos(th4),...
-0.10*sin(th4)+0.4*cos(th4),...
0.03*sin(th4)+0.33*cos(th4),...
0.03*sin(th4)];
yres_42=y04+[0.03*cos(th4),0.03*cos(th4)+0.33*sin(th4),...
0.25*cos(th4)+0.4*sin(th4),...
-0.10*cos(th4)+0.6*sin(th4),...
0.25*cos(th4)+0.8*sin(th4),...
-0.10*cos(th4)+1.0*sin(th4),...
0.25*cos(th4)+1.2*sin(th4),...
0.03*cos(th4)+1.27*sin(th4),...
0.03*cos(th4)+1.6*sin(th4),...
-0.03*cos(th4)+1.6*sin(th4),...
-0.03*cos(th4)+1.27*sin(th4),...
0.10*cos(th4)+1.2*sin(th4),...
-0.25*cos(th4)+1.0*sin(th4),...
0.10*cos(th4)+0.8*sin(th4),...
-0.25*cos(th4)+0.6*sin(th4),...
0.10*cos(th4)+0.4*sin(th4),...
-0.03*cos(th4)+0.33*sin(th4),...
-0.03*cos(th4)];

```

```

x05=1.0;
y05=0.5;
th5=0;

x06=6.0;
y06=-2.5;
th6=pi/2;

x07=-9.5;
y07=0;

xV1_1=x07+[-1.0,1.0,1.0,-1.0];
yV1_1=y07+[-0.05,-0.05,0.05,0.05]+0.3;

xV1_2=x07+[-0.4,0.4,0.4,-0.4];
yV1_2=y07+[-0.1,-0.1,0.1,0.1]-0.1;

x08=6.0;
y08=2.5;
phi8=0:0.01:2*pi;

xI1_1=x08+0.6*cos(phi8);
yI1_1=y08+0.9*sin(phi8);

xI1_2=x08+0.55*cos(phi8);
yI1_2=y08+0.85*sin(phi8);

xI1_3=x08+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI1_3=y08+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

x09=-6.0;
y09=0.5;
phi9=0:0.01:2*pi;

xcable1=[-9.5,-9.5,-8,-8];
ycable1=y02+[0.1,-0.1,-0.1,0.1];

xcable2=[-9.55,-9.45,-9.45,-9.55];
ycable2=[y02+0.1,y02+0.1,y07+0.35,y07+0.35];

xcable3=[-9.55,-9.45,-9.45,-9.55];
ycable3=[y01,y01,y07-0.2,y07-0.2];

xcable4=[-9.5,-9.5,x01,x01];
ycable4=y01+[0.1,-0.1,-0.1,0.1];

xcable5=[9.5,9.5,x01,x01];
ycable5=y01+[0.1,-0.1,-0.1,0.1];

xcable6=[9.5,9.5,x02+1.2,x02+1.2];
ycable6=y02+[0.1,-0.1,-0.1,0.1];

xcable7=[-9.55,-9.45,-9.45,-9.55]+6.5;
ycable7=[y02,y02,y03+1.6,y03+1.6];

xcable8=[-9.55,-9.45,-9.45,-9.55]+6.5;
ycable8=[y04+1.6,y04+1.6,y03,y03];

xcable9=[-9.55,-9.45,-9.45,-9.55]+6.5;
ycable9=[y04,y04,y01,y01];

xcable10=[-3.0,-3.0,x05,x05];
ycable10=y05+[0.1,-0.1,-0.1,0.1];

xcable11=[x06,x06,x05,x05];
ycable11=y05+[0.1,-0.1,-0.1,0.1];

xcable12=[-9.55,-9.45,-9.45,-9.55]+15.5;
ycable12=[y02,y02,y08+0.9,y08+0.9];

xcable13=[-9.55,-9.45,-9.45,-9.55]+15.5;
ycable13=[y05-0.1,y05-0.1,y08-0.9,y08-0.9];

xI_1=x02+2.5+[0.0,0.0,1.0,1.0,1.5,1.0,1.0];
yI_1=y02+[0.1,-0.1,-0.1,-0.3,0.0,0.3,0.1];

```

```

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_21,yres_21,[1.0,1.0,1.0],...
xres_22,yres_22,[0.0,0.0,0.0],...
xres_31,yres_31,[1.0,1.0,1.0],...
xres_32,yres_32,[0.0,0.0,0.0],...
xres_41,yres_41,[1.0,1.0,1.0],...
xres_42,yres_42,[0.0,0.0,0.0],...
xV1_1,yV1_1,[0.0,0.0,0.0],...
xV1_2,yV1_2,[0.0,0.0,0.0],...
xI1_1,yI1_1,[0.0,0.0,0.0],...
xI1_2,yI1_2,[1.0,1.0,1.0],...
xI1_3,yI1_3,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
xcable10,ycable10,[0.8,0.6,0.2],...
xcable11,ycable11,[0.8,0.6,0.2],...
xcable12,ycable12,[0.8,0.6,0.2],...
xcable13,ycable13,[0.8,0.6,0.2],...
xI_1,yI_1,[0.0,0.0,0.0],...
'Linestyle','None')

text(-11,11,'Θα είναι  $R_{345}=R_3+R_{45}='$ 
text(-6.5,11.2,nR345)
text(-5.8,11.2,'Ohm. Αντικαθιστούμε την αντίσταση  $R_{345}$  και την πηγή ρεύματος  $2I_1$ , με το ισοδυναμώ τους ')
text(-11,10,'κατά Thevenin. Επίσης βραχυκυκλώνουμε τα άκρα a,b με ρεύμα βραχυκύκλωσης  $I_N$ . Στο επόμενο
κύκλωμα θα έχουμε ότι')
text(-11,9,' $V_2='$ 
text(-10.2,9.2,ndR345)
text(-9.9,9.0,' $I_1$  Volt, και  $R_{3456}=R_3+R_{45}+R_{46}='$ 
text(-3.8,9.2,nR3456)
text(-3.2,9.2,'Ohm.')

text(9.7,y02,'a','Color',[0.9,0.0,0.0])
text(9.7,y01,'b','Color',[0.9,0.0,0.0])
text(x02+0.5,y02+1.5,' $R_{12}$ ','Color',[0.9,0.2,0.0])
text(x03+0.5,y03+0.75,' $R_{345}$ ','Color',[0.9,0.2,0.0])
text(x04+0.5,y04+0.75,' $R_{46}$ ','Color',[0.9,0.2,0.0])
text(x07-0.75,y07+1.0,' $V_{T1}$ ','Color',[0.0,0.2,0.9])
text(x08+0.85,y08,' $2I_1$ ','Color',[0.0,0.2,0.9])
text(x02+3.0,y02-1.0,' $I_1$ ','Color',[0.0,0.2,0.9])

axis([-12,12,-12,12])
axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
elseif (snmeio==6)
axes(handles.axes1);
cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,8.5,8.5];

x01=-8.0;
y01=-5;
th1=0;

x02=-8.0;
y02=5;
th2=0;

xres_21=x02+[0.40*sin(th2),0.40*sin(th2)+1.2*cos(th2),...
-0.40*sin(th2)+1.2*cos(th2),-0.40*sin(th2)];
yres_21=y02+[-0.40*cos(th2),-0.40*cos(th2)+1.2*sin(th2),...
0.40*cos(th2)+1.2*sin(th2),0.40*cos(th2)];

xres_22=x02+[-0.05*sin(th2),-0.05*sin(th2)+0.25*cos(th2),...
-0.40*sin(th2)+0.3*cos(th2),...
0.25*sin(th2)+0.45*cos(th2),...
-0.40*sin(th2)+0.6*cos(th2),...

```

```

0.25*sin(th2)+0.75*cos(th2),...
-0.40*sin(th2)+0.9*cos(th2),...
-0.05*sin(th2)+0.95*cos(th2),...
-0.05*sin(th2)+1.2*cos(th2),...
0.05*sin(th2)+1.2*cos(th2),...
0.05*sin(th2)+0.95*cos(th2),...
-0.25*sin(th2)+0.9*cos(th2),...
0.40*sin(th2)+0.75*cos(th2),...
-0.25*sin(th2)+0.6*cos(th2),...
0.40*sin(th2)+0.45*cos(th2),...
-0.25*sin(th2)+0.3*cos(th2),...
0.05*sin(th2)+0.25*cos(th2),...
0.05*sin(th2)];
yres_22=y02+[0.05*cos(th2),0.05*cos(th2)+0.25*sin(th2),...
0.40*cos(th2)+0.3*sin(th2),...
-0.25*cos(th2)+0.45*sin(th2),...
0.40*cos(th2)+0.6*sin(th2),...
-0.250*cos(th2)+0.75*sin(th2),...
0.40*cos(th2)+0.9*sin(th2),...
0.05*cos(th2)+0.95*sin(th2),...
0.05*cos(th2)+1.2*sin(th2),...
-0.05*cos(th2)+1.2*sin(th2),...
-0.05*cos(th2)+0.95*sin(th2),...
0.25*cos(th2)+0.9*sin(th2),...
-0.40*cos(th2)+0.75*sin(th2),...
0.25*cos(th2)+0.6*sin(th2),...
-0.40*cos(th2)+0.45*sin(th2),...
0.25*cos(th2)+0.3*sin(th2),...
-0.05*cos(th2)+0.25*sin(th2),...
-0.05*cos(th2)];

x03=-3.0;
y03=2.5;
th3=pi/2;

x04=-3.0;
y04=-2.5;
th4=pi/2;

xres_41=x04+[0.25*sin(th4),0.25*sin(th4)+1.6*cos(th4),...
-0.25*sin(th4)+1.6*cos(th4),-0.25*sin(th4)];
yres_41=y04+[-0.25*cos(th4),-0.25*cos(th4)+1.6*sin(th4),...
0.25*cos(th4)+1.6*sin(th4),0.25*cos(th4)];

xres_42=x04+[-0.03*sin(th4),-0.03*sin(th4)+0.33*cos(th4),...
-0.25*sin(th4)+0.4*cos(th4),...
0.10*sin(th4)+0.6*cos(th4),...
-0.25*sin(th4)+0.8*cos(th4),...
0.10*sin(th4)+1.0*cos(th4),...
-0.25*sin(th4)+1.2*cos(th4),...
-0.03*sin(th4)+1.27*cos(th4),...
-0.03*sin(th4)+1.6*cos(th4),...
0.03*sin(th4)+1.6*cos(th4),...
0.03*sin(th4)+1.27*cos(th4),...
-0.10*sin(th4)+1.2*cos(th4),...
0.25*sin(th4)+1.0*cos(th4),...
-0.10*sin(th4)+0.8*cos(th4),...
0.25*sin(th4)+0.6*cos(th4),...
-0.10*sin(th4)+0.4*cos(th4),...
0.03*sin(th4)+0.33*cos(th4),...
0.03*sin(th4)];
yres_42=y04+[0.03*cos(th4),0.03*cos(th4)+0.33*sin(th4),...
0.25*cos(th4)+0.4*sin(th4),...
-0.10*cos(th4)+0.6*sin(th4),...
0.25*cos(th4)+0.8*sin(th4),...
-0.10*cos(th4)+1.0*sin(th4),...
0.25*cos(th4)+1.2*sin(th4),...
0.03*cos(th4)+1.27*sin(th4),...
0.03*cos(th4)+1.6*sin(th4),...
-0.03*cos(th4)+1.6*sin(th4),...
-0.03*cos(th4)+1.27*sin(th4),...
0.10*cos(th4)+1.2*sin(th4),...
-0.25*cos(th4)+1.0*sin(th4),...
0.10*cos(th4)+0.8*sin(th4),...
-0.25*cos(th4)+0.6*sin(th4),...
0.10*cos(th4)+0.4*sin(th4),...
-0.03*cos(th4)+0.33*sin(th4),...
-0.03*cos(th4)];

```

```

x05=1.0;
y05=0.5;
th5=0;

x06=6.0;
y06=-2.5;
th6=pi/2;

x07=-9.5;
y07=0;

xV1_1=x07+[-1.0,1.0,1.0,-1.0];
yV1_1=y07+[-0.05,-0.05,0.05,0.05]+0.3;

xV1_2=x07+[-0.4,0.4,0.4,-0.4];
yV1_2=y07+[-0.1,-0.1,0.1,0.1]-0.1;

x08=6.0;
y08=2.5;
phi8=0:0.01:2*pi;

x09=-6.0;
y09=0.5;
phi9=0:0.01:2*pi;

x010=-3.0;
y010=y03+0.2;

xV2_1=x010+[-1.0,1.0,1.0,-1.0];
yV2_1=y010+[-0.05,-0.05,0.05,0.05]+0.3;

xV2_2=x010+[-0.4,0.4,0.4,-0.4];
yV2_2=y010+[-0.1,-0.1,0.1,0.1]-0.1;

xcable1=[-9.5,-9.5,-8,-8];
ycable1=y02+[0.1,-0.1,-0.1,0.1];

xcable2=[-9.55,-9.45,-9.45,-9.55];
ycable2=[y02+0.1,y02+0.1,y07+0.35,y07+0.35];

xcable3=[-9.55,-9.45,-9.45,-9.55];
ycable3=[y01,y01,y07-0.2,y07-0.2];

xcable4=[-9.5,-9.5,x01,x01];
ycable4=y01+[0.1,-0.1,-0.1,0.1];

xcable5=[9.5,9.5,x01,x01];
ycable5=y01+[0.1,-0.1,-0.1,0.1];

xcable6=[9.5,9.5,x02+1.2,x02+1.2];
ycable6=y02+[0.1,-0.1,-0.1,0.1];

xcable7=[-9.55,-9.45,-9.45,-9.55]+6.5;
ycable7=[y02,y02,y010+0.35,y010+0.35];

xcable8=[-9.55,-9.45,-9.45,-9.55]+6.5;
ycable8=[y04+1.6,y04+1.6,y03,y03];

xcable9=[-9.55,-9.45,-9.45,-9.55]+6.5;
ycable9=[y04,y04,y01,y01];

xcable14=[9.45,9.55,9.55,9.45];
ycable14=[y01-0.1,y01-0.1,y02+0.1,y02+0.1];

xI_1=x02+2.5+[0.0,0.0,1.0,1.0,1.5,1.0,1.0];
yI_1=y02+[0.1,-0.1,-0.1,-0.3,0.0,0.3,0.1];

xI_2=x04+[-0.05,0.05,0.05,0.3,0.0,-0.3,-0.05];
yI_2=y01+0.5+[0.0,0.0,1.0,1.0,1.5,1.0,1.0];

xI_3=9.5+[-0.05,0.05,0.05,0.3,0.0,-0.3,-0.05];
yI_3=y01+4.5+[0.0,0.0,1.0,1.0,1.5,1.0,1.0];

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...

```



```

xres_21,yres_21,[1.0,1.0,1.0],...
xres_22,yres_22,[0.0,0.0,0.0],...
xres_41,yres_41,[1.0,1.0,1.0],...
xres_42,yres_42,[0.0,0.0,0.0],...
xV1_1,yV1_1,[0.0,0.0,0.0],...
xV1_2,yV1_2,[0.0,0.0,0.0],...
xV2_1,yV2_1,[0.0,0.0,0.0],...
xV2_2,yV2_2,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
xcable14,ycable14,[0.8,0.6,0.2],...
xI_1,yI_1,[0.0,0.0,0.0],...
xI_2,yI_2,[0.0,0.0,0.0],...
xI_3,yI_3,[0.0,0.0,0.0],...
'Linestyle','None')

text(-11,11,'Από τον βρόχο χωρίς την ύπαρξη της βραχυκύκλωσης των άκρων a,b, έχουμε  $V_{T1}-I_{1}R_{12}-V_{2}-I_{1}R_{3456}=0$ .')
text(7,11,'Άρα  $I_{1}=?$ ')
text(8.5,11.2,nI1)
text(9.5,11.2,'A.')
text(-11,10,'Άρα η τάση Thevenin θα είναι  $V_{ab}=V_{2}+R_{3456}I_{1}$ ')
text(-1.4,10.2,nVT)
text(-0.4,10.2,'Volt. Το ρεύμα βραχυκύκλωσης θα είναι ')
text(-11,9.0,' $I_{N}=I_{1}+I_{2}=(V_{T1}/R_{12})+(V_{2}/R_{3456})=?$ ')
text(-5.2,9.0,nIN)
text(-4.4,9.0,'A. Άρα η αντίσταση Thevenin θα είναι  $R_{T}=V_{T}/I_{N}$ ')
text(4.7,9.2,nRT)
text(5.8,9.2,'Ohm.')

text(9.7,y02,'a','Color',[0.9,0.0,0.0])
text(9.7,y01,'b','Color',[0.9,0.0,0.0])
text(x02+0.5,y02+1.5,'R_{12}','Color',[0.9,0.2,0.0])
text(x03+0.5,y03+1.25,'V_{2}','Color',[0.0,0.2,0.9])
text(x04+0.5,y04+0.75,'R_{3456}','Color',[0.9,0.2,0.0])
text(x07-0.75,y07+1.0,'V_{T1}','Color',[0.0,0.2,0.9])
text(x02+3.0,y02-1.0,'I_{1}','Color',[0.0,0.2,0.9])
text(x04+0.5,y01+1.0,'I_{2}','Color',[0.0,0.2,0.9])
text(9.5+0.5,y01+5.0,'I_{N}','Color',[0.0,0.2,0.9])

axis([-12,12,-12,12])
axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
else
end
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

% --- Executes on button press in pushbutton3.
function pushbutton3_Callback(hObject, eventdata, handles)
% hObject handle to pushbutton3 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
global R1;
global R2;
global R3;
global R4;
global R5;
global R6;
global V1;
global J1;

global snmeio;

snmeio=snmeio-1;

if (snmeio==0)
snmeio=6;
end
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
nR1=num2str(0.01*round(100*R1));

```

```

        IN1=(V1/R1)+J1;
        nIN1=num2str(0.01*round(100*IN1));
        VT1=IN1*R1;
        nVT1=num2str(0.01*round(100*VT1));
        R12=R1+R2;
        nR12=num2str(0.01*round(100*R12));
        R45=R4*R5/(R4+R5+R6);
        nR45=num2str(0.01*round(100*R45));
        R46=R4*R6/(R4+R5+R6);
        nR46=num2str(0.01*round(100*R46));
        R56=R6*R5/(R4+R5+R6);
        nR56=num2str(0.01*round(100*R56));
        R345=R3+R45;
        nR345=num2str(0.01*round(100*R345));
        dR345=2*R345;
        ndR345=num2str(0.01*round(100*dR345));
        R3456=R3+R45+R46;
        nR3456=num2str(0.01*round(100*R3456));
        I1=VT1/(R12+2*R345+R3456);
        nI1=num2str(0.01*round(100*I1));
        VT=2*R345*I1+R3456*I1;
        nVT=num2str(0.01*round(100*VT));
        IN=VT1/R12+2*R345*VT1/(R12*R3456);
        nIN=num2str(0.01*round(100*IN));
        RT=VT/IN;
        nRT=num2str(0.01*round(100*RT));
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
        if (snmeio==1)
            axes(handles.axes1);
            cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
            x_back=[-12,12,12,-12];
            y_back=[-12,-12,12,12];

            x_tableau=[-11,11,11,-11];
            y_tableau=[-11,-11,9,9];

            x01=-8.0;
            y01=-5;
            th1=0;

            xres_11=x01+[0.40*sin(th1),0.40*sin(th1)+1.2*cos(th1),...
                -0.40*sin(th1)+1.2*cos(th1),-0.40*sin(th1)];
            yres_11=y01+[-0.40*cos(th1),-0.40*cos(th1)+1.2*sin(th1),...
                0.40*cos(th1)+1.2*sin(th1),0.40*cos(th1)];

            xres_12=x01+[-0.05*sin(th1),-0.05*sin(th1)+0.25*cos(th1),...
                -0.40*sin(th1)+0.3*cos(th1),...
                0.25*sin(th1)+0.45*cos(th1),...
                -0.40*sin(th1)+0.6*cos(th1),...
                0.25*sin(th1)+0.75*cos(th1),...
                -0.40*sin(th1)+0.9*cos(th1),...
                -0.05*sin(th1)+0.95*cos(th1),...
                -0.05*sin(th1)+1.2*cos(th1),...
                0.05*sin(th1)+1.2*cos(th1),...
                0.05*sin(th1)+0.95*cos(th1),...
                -0.25*sin(th1)+0.9*cos(th1),...
                0.40*sin(th1)+0.75*cos(th1),...
                -0.25*sin(th1)+0.6*cos(th1),...
                0.40*sin(th1)+0.45*cos(th1),...
                -0.25*sin(th1)+0.3*cos(th1),...
                0.05*sin(th1)+0.25*cos(th1),...
                0.05*sin(th1)];
            yres_12=y01+[0.05*cos(th1),0.05*cos(th1)+0.25*sin(th1),...
                0.40*cos(th1)+0.3*sin(th1),...
                -0.25*cos(th1)+0.45*sin(th1),...
                0.40*cos(th1)+0.6*sin(th1),...
                -0.250*cos(th1)+0.75*sin(th1),...
                0.40*cos(th1)+0.9*sin(th1),...
                0.05*cos(th1)+0.95*sin(th1),...
                0.05*cos(th1)+1.2*sin(th1),...
                -0.05*cos(th1)+1.2*sin(th1),...
                -0.05*cos(th1)+0.95*sin(th1),...
                0.25*cos(th1)+0.9*sin(th1),...
                -0.40*cos(th1)+0.75*sin(th1),...
                0.25*cos(th1)+0.6*sin(th1),...
                -0.40*cos(th1)+0.45*sin(th1),...
                0.25*cos(th1)+0.3*sin(th1),...
                -0.05*cos(th1)+0.25*sin(th1),...
                -0.05*cos(th1)];

```

```

x02=-8.0;
y02=5;
th2=0;

xres_21=x02+[0.40*sin(th2),0.40*sin(th2)+1.2*cos(th2),...
-0.40*sin(th2)+1.2*cos(th2),-0.40*sin(th2)];
yres_21=y02+[-0.40*cos(th2),-0.40*cos(th2)+1.2*sin(th2),...
0.40*cos(th2)+1.2*sin(th2),0.40*cos(th2)];

xres_22=x02+[-0.05*sin(th2),-0.05*sin(th2)+0.25*cos(th2),...
-0.40*sin(th2)+0.3*cos(th2),...
0.25*sin(th2)+0.45*cos(th2),...
-0.40*sin(th2)+0.6*cos(th2),...
0.25*sin(th2)+0.75*cos(th2),...
-0.40*sin(th2)+0.9*cos(th2),...
-0.05*sin(th2)+0.95*cos(th2),...
-0.05*sin(th2)+1.2*cos(th2),...
0.05*sin(th2)+1.2*cos(th2),...
0.05*sin(th2)+0.95*cos(th2),...
-0.25*sin(th2)+0.9*cos(th2),...
0.40*sin(th2)+0.75*cos(th2),...
-0.25*sin(th2)+0.6*cos(th2),...
0.40*sin(th2)+0.45*cos(th2),...
-0.25*sin(th2)+0.3*cos(th2),...
0.05*sin(th2)+0.25*cos(th2),...
0.05*sin(th2)];
yres_22=y02+[0.05*cos(th2),0.05*cos(th2)+0.25*sin(th2),...
0.40*cos(th2)+0.3*sin(th2),...
-0.25*cos(th2)+0.45*sin(th2),...
0.40*cos(th2)+0.6*sin(th2),...
-0.250*cos(th2)+0.75*sin(th2),...
0.40*cos(th2)+0.9*sin(th2),...
0.05*cos(th2)+0.95*sin(th2),...
0.05*cos(th2)+1.2*sin(th2),...
-0.05*cos(th2)+1.2*sin(th2),...
-0.05*cos(th2)+0.95*sin(th2),...
0.25*cos(th2)+0.9*sin(th2),...
-0.40*cos(th2)+0.75*sin(th2),...
0.25*cos(th2)+0.6*sin(th2),...
-0.40*cos(th2)+0.45*sin(th2),...
0.25*cos(th2)+0.3*sin(th2),...
-0.05*cos(th2)+0.25*sin(th2),...
-0.05*cos(th2)];

x03=-3.0;
y03=2.5;
th3=pi/2;

xres_31=x03+[0.25*sin(th3),0.25*sin(th3)+1.6*cos(th3),...
-0.25*sin(th3)+1.6*cos(th3),-0.25*sin(th3)];
yres_31=y03+[-0.25*cos(th3),-0.25*cos(th3)+1.6*sin(th3),...
0.25*cos(th3)+1.6*sin(th3),0.25*cos(th3)];

xres_32=x03+[-0.03*sin(th3),-0.03*sin(th3)+0.33*cos(th3),...
-0.25*sin(th3)+0.4*cos(th3),...
0.10*sin(th3)+0.6*cos(th3),...
-0.25*sin(th3)+0.8*cos(th3),...
0.10*sin(th3)+1.0*cos(th3),...
-0.25*sin(th3)+1.2*cos(th3),...
-0.03*sin(th3)+1.27*cos(th3),...
-0.03*sin(th3)+1.6*cos(th3),...
0.03*sin(th3)+1.6*cos(th3),...
0.03*sin(th3)+1.27*cos(th3),...
-0.10*sin(th3)+1.2*cos(th3),...
0.25*sin(th3)+1.0*cos(th3),...
-0.10*sin(th3)+0.8*cos(th3),...
0.25*sin(th3)+0.6*cos(th3),...
-0.10*sin(th3)+0.4*cos(th3),...
0.03*sin(th3)+0.33*cos(th3),...
0.03*sin(th3)];
yres_32=y03+[0.03*cos(th3),0.03*cos(th3)+0.33*sin(th3),...
0.25*cos(th3)+0.4*sin(th3),...
-0.10*cos(th3)+0.6*sin(th3),...
0.25*cos(th3)+0.8*sin(th3),...
-0.10*cos(th3)+1.0*sin(th3),...
0.25*cos(th3)+1.2*sin(th3),...
0.03*cos(th3)+1.27*sin(th3),...
0.03*cos(th3)+1.6*sin(th3),...
-0.03*cos(th3)+1.6*sin(th3),...
-0.03*cos(th3)+1.27*sin(th3),...

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0.10*cos(th3)+1.2*sin(th3),...
-0.25*cos(th3)+1.0*sin(th3),...
0.10*cos(th3)+0.8*sin(th3),...
-0.25*cos(th3)+0.6*sin(th3),...
0.10*cos(th3)+0.4*sin(th3),...
-0.03*cos(th3)+0.33*sin(th3),...
-0.03*cos(th3)];

x04=-3.0;
y04=-2.5;
th4=pi/2;

xres_41=x04+[0.25*sin(th4),0.25*sin(th4)+1.6*cos(th4),...
-0.25*sin(th4)+1.6*cos(th4),-0.25*sin(th4)];
yres_41=y04+[-0.25*cos(th4),-0.25*cos(th4)+1.6*sin(th4),...
0.25*cos(th4)+1.6*sin(th4),0.25*cos(th4)];

xres_42=x04+[-0.03*sin(th4),-0.03*sin(th4)+0.33*cos(th4),...
-0.25*sin(th4)+0.4*cos(th4),...
0.10*sin(th4)+0.6*cos(th4),...
-0.25*sin(th4)+0.8*cos(th4),...
0.10*sin(th4)+1.0*cos(th4),...
-0.25*sin(th4)+1.2*cos(th4),...
-0.03*sin(th4)+1.27*cos(th4),...
-0.03*sin(th4)+1.6*cos(th4),...
0.03*sin(th4)+1.6*cos(th4),...
0.03*sin(th4)+1.27*cos(th4),...
-0.10*sin(th4)+1.2*cos(th4),...
0.25*sin(th4)+1.0*cos(th4),...
-0.10*sin(th4)+0.8*cos(th4),...
0.25*sin(th4)+0.6*cos(th4),...
-0.10*sin(th4)+0.4*cos(th4),...
0.03*sin(th4)+0.33*cos(th4),...
0.03*sin(th4)];
yres_42=y04+[0.03*cos(th4),0.03*cos(th4)+0.33*sin(th4),...
0.25*cos(th4)+0.4*sin(th4),...
-0.10*cos(th4)+0.6*sin(th4),...
0.25*cos(th4)+0.8*sin(th4),...
-0.10*cos(th4)+1.0*sin(th4),...
0.25*cos(th4)+1.2*sin(th4),...
0.03*cos(th4)+1.27*sin(th4),...
0.03*cos(th4)+1.6*sin(th4),...
-0.03*cos(th4)+1.6*sin(th4),...
-0.03*cos(th4)+1.27*sin(th4),...
0.10*cos(th4)+1.2*sin(th4),...
-0.25*cos(th4)+1.0*sin(th4),...
0.10*cos(th4)+0.8*sin(th4),...
-0.25*cos(th4)+0.6*sin(th4),...
0.10*cos(th4)+0.4*sin(th4),...
-0.03*cos(th4)+0.33*sin(th4),...
-0.03*cos(th4)];

x05=1.0;
y05=0.5;
th5=0;

xres_51=x05+[0.40*sin(th5),0.40*sin(th5)+1.2*cos(th5),...
-0.40*sin(th5)+1.2*cos(th5),-0.40*sin(th5)];
yres_51=y05+[-0.40*cos(th5),-0.40*cos(th5)+1.2*sin(th5),...
0.40*cos(th5)+1.2*sin(th5),0.40*cos(th5)];

xres_52=x05+[-0.05*sin(th5),-0.05*sin(th5)+0.25*cos(th5),...
-0.40*sin(th5)+0.3*cos(th5),...
0.25*sin(th5)+0.45*cos(th5),...
-0.40*sin(th5)+0.6*cos(th5),...
0.25*sin(th5)+0.75*cos(th5),...
-0.40*sin(th5)+0.9*cos(th5),...
-0.05*sin(th5)+0.95*cos(th5),...
-0.05*sin(th5)+1.2*cos(th5),...
0.05*sin(th5)+1.2*cos(th5),...
0.05*sin(th5)+0.95*cos(th5),...
-0.25*sin(th5)+0.9*cos(th5),...
0.40*sin(th5)+0.75*cos(th5),...
-0.25*sin(th5)+0.6*cos(th5),...
0.40*sin(th5)+0.45*cos(th5),...
-0.25*sin(th5)+0.3*cos(th5),...
0.05*sin(th5)+0.25*cos(th5),...
0.05*sin(th5)];
yres_52=y05+[0.05*cos(th5),0.05*cos(th5)+0.25*sin(th5),...
0.40*cos(th5)+0.3*sin(th5),...

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-0.25*cos(th5)+0.45*sin(th5),...
0.40*cos(th5)+0.6*sin(th5),...
-0.250*cos(th5)+0.75*sin(th5),...
0.40*cos(th5)+0.9*sin(th5),...
0.05*cos(th5)+0.95*sin(th5),...
0.05*cos(th5)+1.2*sin(th5),...
-0.05*cos(th5)+1.2*sin(th5),...
-0.05*cos(th5)+0.95*sin(th5),...
0.25*cos(th5)+0.9*sin(th5),...
-0.40*cos(th5)+0.75*sin(th5),...
0.25*cos(th5)+0.6*sin(th5),...
-0.40*cos(th5)+0.45*sin(th5),...
0.25*cos(th5)+0.3*sin(th5),...
-0.05*cos(th5)+0.25*sin(th5),...
-0.05*cos(th5)];

x06=6.0;
y06=-2.5;
th6=pi/2;

xres_61=x06+[0.25*sin(th6),0.25*sin(th6)+1.6*cos(th6),...
-0.25*sin(th6)+1.6*cos(th6),-0.25*sin(th6)];
yres_61=y06+[-0.25*cos(th6),-0.25*cos(th6)+1.6*sin(th6),...
0.25*cos(th6)+1.6*sin(th6),0.25*cos(th6)];

xres_62=x06+[-0.03*sin(th6),-0.03*sin(th6)+0.33*cos(th6),...
-0.25*sin(th6)+0.4*cos(th6),...
0.10*sin(th6)+0.6*cos(th6),...
-0.25*sin(th6)+0.8*cos(th6),...
0.10*sin(th6)+1.0*cos(th6),...
-0.25*sin(th6)+1.2*cos(th6),...
-0.03*sin(th6)+1.27*cos(th6),...
-0.03*sin(th6)+1.6*cos(th6),...
0.03*sin(th6)+1.6*cos(th6),...
0.03*sin(th6)+1.27*cos(th6),...
-0.10*sin(th6)+1.2*cos(th6),...
0.25*sin(th6)+1.0*cos(th6),...
-0.10*sin(th6)+0.8*cos(th6),...
0.25*sin(th6)+0.6*cos(th6),...
-0.10*sin(th6)+0.4*cos(th6),...
0.03*sin(th6)+0.33*cos(th6),...
0.03*sin(th6)];
yres_62=y06+[0.03*cos(th6),0.03*cos(th6)+0.33*sin(th6),...
0.25*cos(th6)+0.4*sin(th6),...
-0.10*cos(th6)+0.6*sin(th6),...
0.25*cos(th6)+0.8*sin(th6),...
-0.10*cos(th6)+1.0*sin(th6),...
0.25*cos(th6)+1.2*sin(th6),...
0.03*cos(th6)+1.27*sin(th6),...
0.03*cos(th6)+1.6*sin(th6),...
-0.03*cos(th6)+1.6*sin(th6),...
-0.03*cos(th6)+1.27*sin(th6),...
0.10*cos(th6)+1.2*sin(th6),...
-0.25*cos(th6)+1.0*sin(th6),...
0.10*cos(th6)+0.8*sin(th6),...
-0.25*cos(th6)+0.6*sin(th6),...
0.10*cos(th6)+0.4*sin(th6),...
-0.03*cos(th6)+0.33*sin(th6),...
-0.03*cos(th6)];

x07=-9.5;
y07=0;

xv1_1=x07+[-1.0,1.0,1.0,-1.0];
yv1_1=y07+[-0.05,-0.05,0.05,0.05]+0.3;

xv1_2=x07+[-0.4,0.4,0.4,-0.4];
yv1_2=y07+[-0.1,-0.1,0.1,0.1]-0.1;

x08=6.0;
y08=2.5;
phi8=0:0.01:2*pi;

xI1_1=x08+0.6*cos(phi8);
yI1_1=y08+0.9*sin(phi8);

xI1_2=x08+0.55*cos(phi8);
yI1_2=y08+0.85*sin(phi8);

```

```

xI1_3=x08+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI1_3=y08+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

x09=-6.0;
y09=0.5;
phi9=0:0.01:2*pi;

xI2_1=x09+0.6*cos(phi9);
yI2_1=y09+0.9*sin(phi9);

xI2_2=x09+0.55*cos(phi9);
yI2_2=y09+0.85*sin(phi9);

xI2_3=x09+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI2_3=y09+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

xcable1=[-9.5,-9.5,-8,-8];
ycable1=y02+[0.1,-0.1,-0.1,0.1];

xcable2=[-9.55,-9.45,-9.45,-9.55];
ycable2=[y02+0.1,y02+0.1,y07+0.35,y07+0.35];

xcable3=[-9.55,-9.45,-9.45,-9.55];
ycable3=[y01,y01,y07-0.2,y07-0.2];

xcable4=[-9.5,-9.5,x01,x01];
ycable4=y01+[0.1,-0.1,-0.1,0.1];

xcable5=[9.5,9.5,x01+1.2,x01+1.2];
ycable5=y01+[0.1,-0.1,-0.1,0.1];

xcable6=[9.5,9.5,x02+1.2,x02+1.2];
ycable6=y02+[0.1,-0.1,-0.1,0.1];

xcable7=[-9.55,-9.45,-9.45,-9.55]+6.5;
ycable7=[y02,y02,y03+1.6,y03+1.6];

xcable8=[-9.55,-9.45,-9.45,-9.55]+6.5;
ycable8=[y04+1.6,y04+1.6,y03,y03];

xcable9=[-9.55,-9.45,-9.45,-9.55]+6.5;
ycable9=[y04,y04,y01,y01];

xcable10=[-3.0,-3.0,x05,x05];
ycable10=y05+[0.1,-0.1,-0.1,0.1];

xcable11=[x06,x06,x05+1.2,x05+1.2];
ycable11=y05+[0.1,-0.1,-0.1,0.1];

xcable12=[-9.55,-9.45,-9.45,-9.55]+15.5;
ycable12=[y02,y02,y08+0.9,y08+0.9];

xcable13=[-9.55,-9.45,-9.45,-9.55]+15.5;
ycable13=[y06+1.6,y06+1.6,y08-0.9,y08-0.9];

xcable14=[-9.55,-9.45,-9.45,-9.55]+15.5;
ycable14=[y06,y06,y01,y01];

xcable15=[-9.5,-9.5,x09,x09];
ycable15=y02+[0.1,-0.1,-0.1,0.1]-2.0;

xcable16=[-9.55,-9.45,-9.45,-9.55]+3.5;
ycable16=[y02-1.9,y02-1.9,y09+0.9,y09+0.9];

xcable17=[-9.55,-9.45,-9.45,-9.55]+3.5;
ycable17=[y01,y01,y09-0.9,y09-0.9];

xI_1=x02+2.5+[0.0,0.0,1.0,1.0,1.5,1.0,1.0];
yI_1=y02+[0.1,-0.1,-0.1,-0.3,0.0,0.3,0.1];

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_11,yres_11,[1.0,1.0,1.0],...
xres_12,yres_12,[0.0,0.0,0.0],...
xres_21,yres_21,[1.0,1.0,1.0],...
xres_22,yres_22,[0.0,0.0,0.0],...
xres_31,yres_31,[1.0,1.0,1.0],...
xres_32,yres_32,[0.0,0.0,0.0],...

```

```

xres_41,yres_41,[1.0,1.0,1.0],...
xres_42,yres_42,[0.0,0.0,0.0],...
xres_51,yres_51,[1.0,1.0,1.0],...
xres_52,yres_52,[0.0,0.0,0.0],...
xres_61,yres_61,[1.0,1.0,1.0],...
xres_62,yres_62,[0.0,0.0,0.0],...
xV1_1,yV1_1,[0.0,0.0,0.0],...
xV1_2,yV1_2,[0.0,0.0,0.0],...
xI1_1,yI1_1,[0.0,0.0,0.0],...
xI1_2,yI1_2,[1.0,1.0,1.0],...
xI1_3,yI1_3,[0.0,0.0,0.0],...
xI2_1,yI2_1,[0.0,0.0,0.0],...
xI2_2,yI2_2,[1.0,1.0,1.0],...
xI2_3,yI2_3,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
xcable10,ycable10,[0.8,0.6,0.2],...
xcable11,ycable11,[0.8,0.6,0.2],...
xcable12,ycable12,[0.8,0.6,0.2],...
xcable13,ycable13,[0.8,0.6,0.2],...
xcable14,ycable14,[0.8,0.6,0.2],...
xcable15,ycable15,[0.8,0.6,0.2],...
xcable16,ycable16,[0.8,0.6,0.2],...
xcable17,ycable17,[0.8,0.6,0.2],...
xI_1,yI_1,[0.0,0.0,0.0],...
'Linestyle','None')

text(-11,11,'Υπολογίζουμε κατ' αρχήν το ισοδύναμο Thevenin του κυκλώματος απο τα άκρα c, d. Θα έχουμε')
text(9.7,y02,'a','Color',[0.9,0.0,0.0])
text(9.7,y01,'b','Color',[0.9,0.0,0.0])
text(x01+0.5,y01-1.5,'R_1','Color',[0.9,0.2,0.0])
text(x02+0.5,y02+1.5,'R_2','Color',[0.9,0.2,0.0])
text(x03+0.5,y03+0.75,'R_3','Color',[0.9,0.2,0.0])
text(x04+0.5,y04+0.75,'R_4','Color',[0.9,0.2,0.0])
text(x05+0.5,y05-1.5,'R_5','Color',[0.9,0.2,0.0])
text(x06+0.5,y06+0.75,'R_6','Color',[0.9,0.2,0.0])
text(x07-0.75,y07+1.0,'V_1','Color',[0.0,0.2,0.9])
text(x09+0.85,y09,'J_1','Color',[0.0,0.2,0.9])
text(x08+0.85,y08,'2I_1','Color',[0.0,0.2,0.9])
text(x02+3.0,y02-1.0,'I_1','Color',[0.0,0.2,0.9])
text(-9.7,y02+1.0,'c','Color',[0.9,0.0,0.0])
text(x04,y01-1.0,'d','Color',[0.9,0.0,0.0])

axis([-12,12,-12,12])
axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
elseif (snmeio==2)
axes(handles.axes1);
cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,8.5,8.5];

x01=-8.0;
y01=-5;
th1=0;

xres_11=x01+[0.40*sin(th1),0.40*sin(th1)+1.2*cos(th1),...
-0.40*sin(th1)+1.2*cos(th1),-0.40*sin(th1)];
yres_11=y01+[-0.40*cos(th1),-0.40*cos(th1)+1.2*sin(th1),...
0.40*cos(th1)+1.2*sin(th1),0.40*cos(th1)];

xres_12=x01+[-0.05*sin(th1),-0.05*sin(th1)+0.25*cos(th1),...
-0.40*sin(th1)+0.3*cos(th1),...
0.25*sin(th1)+0.45*cos(th1),...
-0.40*sin(th1)+0.6*cos(th1),...
0.25*sin(th1)+0.75*cos(th1),...
-0.40*sin(th1)+0.9*cos(th1),...
-0.05*sin(th1)+0.95*cos(th1),...

```

```

-0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+0.95*cos(th1),...
-0.25*sin(th1)+0.9*cos(th1),...
0.40*sin(th1)+0.75*cos(th1),...
-0.25*sin(th1)+0.6*cos(th1),...
0.40*sin(th1)+0.45*cos(th1),...
-0.25*sin(th1)+0.3*cos(th1),...
0.05*sin(th1)+0.25*cos(th1),...
0.05*sin(th1)];
yres_12=y01+[0.05*cos(th1),0.05*cos(th1)+0.25*sin(th1),...
0.40*cos(th1)+0.3*sin(th1),...
-0.25*cos(th1)+0.45*sin(th1),...
0.40*cos(th1)+0.6*sin(th1),...
-0.250*cos(th1)+0.75*sin(th1),...
0.40*cos(th1)+0.9*sin(th1),...
0.05*cos(th1)+0.95*sin(th1),...
0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+0.95*sin(th1),...
0.25*cos(th1)+0.9*sin(th1),...
-0.40*cos(th1)+0.75*sin(th1),...
0.25*cos(th1)+0.6*sin(th1),...
-0.40*cos(th1)+0.45*sin(th1),...
0.25*cos(th1)+0.3*sin(th1),...
-0.05*cos(th1)+0.25*sin(th1),...
-0.05*cos(th1)];

y02=5;

x07=-9.5;
y07=0;

xv1_1=x07+[-1.0,1.0,1.0,-1.0];
yv1_1=y07+[-0.05,-0.05,0.05,0.05]+0.3;

xv1_2=x07+[-0.4,0.4,0.4,-0.4];
yv1_2=y07+[-0.1,-0.1,0.1,0.1]-0.1;

x09=-6.0;
y09=0.5;
phi9=0:0.01:2*pi;

xI2_1=x09+0.6*cos(phi9);
yI2_1=y09+0.9*sin(phi9);

xI2_2=x09+0.55*cos(phi9);
yI2_2=y09+0.85*sin(phi9);

xI2_3=x09+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI2_3=y09+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

xcable1=[-9.5,-9.5,-2,-2];
ycable1=y02+[0.1,-0.1,-0.1,0.1];

xcable2=[-9.55,-9.45,-9.45,-9.55];
ycable2=[y02+0.1,y02+0.1,y07+0.35,y07+0.35];

xcable3=[-9.55,-9.45,-9.45,-9.55];
ycable3=[y01,y01,y07-0.2,y07-0.2];

xcable4=[-9.5,-9.5,x01,x01];
ycable4=y01+[0.1,-0.1,-0.1,0.1];

xcable5=[-2.0,-2.0,x01+1.2,x01+1.2];
ycable5=y01+[0.1,-0.1,-0.1,0.1];

xcable6=[-9.55,-9.45,-9.45,-9.55]+3.5;
ycable6=[y02+0.1,y02+0.1,y09+0.9,y09+0.9];

xcable7=[-9.55,-9.45,-9.45,-9.55]+3.5;
ycable7=[y01+0.1,y01+0.1,y09-0.9,y09-0.9];

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

x01=-8.0;
y01=-5;
th1=0;

xres_11_1=x01+[0.40*sin(th1),0.40*sin(th1)+1.2*cos(th1),...
-0.40*sin(th1)+1.2*cos(th1),-0.40*sin(th1)]+10.0;

```



```

yres_11_1=y01+[-0.40*cos(th1),-0.40*cos(th1)+1.2*sin(th1),...
0.40*cos(th1)+1.2*sin(th1),0.40*cos(th1)];

xres_12_1=x01+[-0.05*sin(th1),-0.05*sin(th1)+0.25*cos(th1),...
-0.40*sin(th1)+0.3*cos(th1),...
0.25*sin(th1)+0.45*cos(th1),...
-0.40*sin(th1)+0.6*cos(th1),...
0.25*sin(th1)+0.75*cos(th1),...
-0.40*sin(th1)+0.9*cos(th1),...
-0.05*sin(th1)+0.95*cos(th1),...
-0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+0.95*cos(th1),...
-0.25*sin(th1)+0.9*cos(th1),...
0.40*sin(th1)+0.75*cos(th1),...
-0.25*sin(th1)+0.6*cos(th1),...
0.40*sin(th1)+0.45*cos(th1),...
-0.25*sin(th1)+0.3*cos(th1),...
0.05*sin(th1)+0.25*cos(th1),...
0.05*sin(th1)]+10.0;

yres_12_1=y01+[0.05*cos(th1),0.05*cos(th1)+0.25*sin(th1),...
0.40*cos(th1)+0.3*sin(th1),...
-0.25*cos(th1)+0.45*sin(th1),...
0.40*cos(th1)+0.6*sin(th1),...
-0.250*cos(th1)+0.75*sin(th1),...
0.40*cos(th1)+0.9*sin(th1),...
0.05*cos(th1)+0.95*sin(th1),...
0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+0.95*sin(th1),...
0.25*cos(th1)+0.9*sin(th1),...
-0.40*cos(th1)+0.75*sin(th1),...
0.25*cos(th1)+0.6*sin(th1),...
-0.40*cos(th1)+0.45*sin(th1),...
0.25*cos(th1)+0.3*sin(th1),...
-0.05*cos(th1)+0.25*sin(th1),...
-0.05*cos(th1)];

y02=5;

x07=-9.5;
y07=0;

xV1_1_1=x07+[-1.0,1.0,1.0,-1.0]+10.0;
yV1_1_1=y07+[-0.05,-0.05,0.05,0.05]+0.3;

xV1_2_1=x07+[-0.4,0.4,0.4,-0.4]+10.0;
yV1_2_1=y07+[-0.1,-0.1,0.1,0.1]-0.1;

x09=-6.0;
y09=0.5;
phi9=0:0.01:2*pi;

xI2_1_1=x09+0.6*cos(phi9)+10.0;
yI2_1_1=y09+0.9*sin(phi9);

xI2_2_1=x09+0.55*cos(phi9)+10.0;
yI2_2_1=y09+0.85*sin(phi9);

xI2_3_1=x09+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05]+10.0;
yI2_3_1=y09+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

xcable1_1=[-9.5,-9.5,-2,-2]+10.0;
ycable1_1=y02+[0.1,-0.1,-0.1,0.1];

xcable2_1=[-9.55,-9.45,-9.45,-9.55]+10.0;
ycable2_1=[y02+0.1,y02+0.1,y07+0.35,y07+0.35];

xcable3_1=[-9.55,-9.45,-9.45,-9.55]+10.0;
ycable3_1=[y01,y01,y07-0.2,y07-0.2];

xcable4_1=[-9.5,-9.5,x01,x01]+10.0;
ycable4_1=y01+[0.1,-0.1,-0.1,0.1];

xcable5_1=[-2.0,-2.0,x01+1.2,x01+1.2]+10.0;
ycable5_1=y01+[0.1,-0.1,-0.1,0.1];

xcable6_1=[-9.55,-9.45,-9.45,-9.55]+3.5+10.0;
ycable6_1=[y02+0.1,y02+0.1,y09+0.9,y09+0.9];

xcable7_1=[-9.55,-9.45,-9.45,-9.55]+3.5+10.0;

```

```

ycable7_1=[y01+0.1,y01+0.1,y09-0.9,y09-0.9];

xcable8_1=[7.95,8.05,8.05,7.95];
ycable8_1=[y02+0.1,y02+0.1,y01-0.1,y01-0.1];

xI_n=8.0+[-0.05,0.05,0.05,0.25,0.0,-0.25,-0.05];
yI_n=y02-3.0+[0.0,0.0,-1.0,-1.0,-1.5,-1.0,-1.0];
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

```

```

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_11,yres_11,[1.0,1.0,1.0],...
xres_12,yres_12,[0.0,0.0,0.0],...
xV1_1,yV1_1,[0.0,0.0,0.0],...
xV1_2,yV1_2,[0.0,0.0,0.0],...
xI2_1,yI2_1,[0.0,0.0,0.0],...
xI2_2,yI2_2,[1.0,1.0,1.0],...
xI2_3,yI2_3,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xres_11_1,yres_11_1,[1.0,1.0,1.0],...
xres_12_1,yres_12_1,[0.0,0.0,0.0],...
xV1_1_1,yV1_1_1,[0.0,0.0,0.0],...
xV1_2_1,yV1_2_1,[0.0,0.0,0.0],...
xI2_1_1,yI2_1_1,[0.0,0.0,0.0],...
xI2_2_1,yI2_2_1,[1.0,1.0,1.0],...
xI2_3_1,yI2_3_1,[0.0,0.0,0.0],...
xcable1_1,ycable1_1,[0.8,0.6,0.2],...
xcable2_1,ycable2_1,[0.8,0.6,0.2],...
xcable3_1,ycable3_1,[0.8,0.6,0.2],...
xcable4_1,ycable4_1,[0.8,0.6,0.2],...
xcable5_1,ycable5_1,[0.8,0.6,0.2],...
xcable6_1,ycable6_1,[0.8,0.6,0.2],...
xcable7_1,ycable7_1,[0.8,0.6,0.2],...
xcable8_1,ycable8_1,[0.8,0.6,0.2],...
xI_n,yI_n,[0.0,0.0,0.0],...
'LineStyle','None')

```

```

text(-11,11,'Από το αριστερό κύκλωμα βραχυκυκλώνοντας την πηγή τάσης και ανοίγοντας την πηγή ρεύματος έχουμε
ότι η αντίσταση Thevenin')

```

```

text(-11,10,'είναι  $R_{T1}=R_1$ =')
text(-8,10.2,nR1)
text(-7.6,10.2,'Ohm.')

```

```

text(-6.5,10,'Το ρεύμα βραχυκύκλωσης των άκρων c, d είναι  $I_{N1}=(V_1/R_1)+J_1$ =')
text(5.0,10.2,nIN1)

```

```

text(5.4,10.2,'Α. Άρα η τάση Thevenin θα είναι')
text(-11,9,' $V_{T1}=I_{N1}R_{T1}$ =')
text(-8.5,9.2,nVT1)
text(-8.0,9.2,'Volt.')

```

```

text(x07-1.0,y07+1.0,' $V_1$ ','Color',[0.0,0.2,0.9])
text(x01+0.5,y01-1.5,' $R_1$ ','Color',[0.9,0.2,0.0])
text(x09+0.85,y09,' $J_1$ ','Color',[0.0,0.2,0.9])
text(-2.0,y02+1.0,'c','Color',[0.9,0.0,0.0])
text(-2.0,y01-1.0,'d','Color',[0.9,0.0,0.0])
text(x07-1.0+10.0,y07+1.0,' $V_1$ ','Color',[0.0,0.2,0.9])
text(x01+0.5+10.0,y01-1.5,' $R_1$ ','Color',[0.9,0.2,0.0])
text(x09+0.85+10.0,y09,' $J_1$ ','Color',[0.0,0.2,0.9])
text(-2.0+10.0,y02+1.0,'c','Color',[0.9,0.0,0.0])
text(-2.0+10.0,y01-1.0,'d','Color',[0.9,0.0,0.0])
text(x07-1.0+10.0+7.5,y07+1.0,' $I_{N1}$ ','Color',[0.0,0.2,0.9])

```

```

axis([-12,12,-12,12])
axis off;

```

```

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
elseif (snmeio==3)
axes(handles.axes1);
cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=[-12,12,12,-12];

```

```

y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,9,9];

x01=-8.0;
y01=-5;
th1=0;

x02=-8.0;
y02=5;
th2=0;

xres_21=x02+[0.40*sin(th2),0.40*sin(th2)+1.2*cos(th2),...
-0.40*sin(th2)+1.2*cos(th2),-0.40*sin(th2)];
yres_21=y02+[-0.40*cos(th2),-0.40*cos(th2)+1.2*sin(th2),...
0.40*cos(th2)+1.2*sin(th2),0.40*cos(th2)];

xres_22=x02+[-0.05*sin(th2),-0.05*sin(th2)+0.25*cos(th2),...
-0.40*sin(th2)+0.3*cos(th2),...
0.25*sin(th2)+0.45*cos(th2),...
-0.40*sin(th2)+0.6*cos(th2),...
0.25*sin(th2)+0.75*cos(th2),...
-0.40*sin(th2)+0.9*cos(th2),...
-0.05*sin(th2)+0.95*cos(th2),...
-0.05*sin(th2)+1.2*cos(th2),...
0.05*sin(th2)+1.2*cos(th2),...
0.05*sin(th2)+0.95*cos(th2),...
-0.25*sin(th2)+0.9*cos(th2),...
0.40*sin(th2)+0.75*cos(th2),...
-0.25*sin(th2)+0.6*cos(th2),...
0.40*sin(th2)+0.45*cos(th2),...
-0.25*sin(th2)+0.3*cos(th2),...
0.05*sin(th2)+0.25*cos(th2),...
0.05*sin(th2)];
yres_22=y02+[0.05*cos(th2),0.05*cos(th2)+0.25*sin(th2),...
0.40*cos(th2)+0.3*sin(th2),...
-0.25*cos(th2)+0.45*sin(th2),...
0.40*cos(th2)+0.6*sin(th2),...
-0.250*cos(th2)+0.75*sin(th2),...
0.40*cos(th2)+0.9*sin(th2),...
0.05*cos(th2)+0.95*sin(th2),...
0.05*cos(th2)+1.2*sin(th2),...
-0.05*cos(th2)+1.2*sin(th2),...
-0.05*cos(th2)+0.95*sin(th2),...
0.25*cos(th2)+0.9*sin(th2),...
-0.40*cos(th2)+0.75*sin(th2),...
0.25*cos(th2)+0.6*sin(th2),...
-0.40*cos(th2)+0.45*sin(th2),...
0.25*cos(th2)+0.3*sin(th2),...
-0.05*cos(th2)+0.25*sin(th2),...
-0.05*cos(th2)];

x03=-3.0;
y03=2.5;
th3=pi/2;

xres_31=x03+[0.25*sin(th3),0.25*sin(th3)+1.6*cos(th3),...
-0.25*sin(th3)+1.6*cos(th3),-0.25*sin(th3)];
yres_31=y03+[-0.25*cos(th3),-0.25*cos(th3)+1.6*sin(th3),...
0.25*cos(th3)+1.6*sin(th3),0.25*cos(th3)];

xres_32=x03+[-0.03*sin(th3),-0.03*sin(th3)+0.33*cos(th3),...
-0.25*sin(th3)+0.4*cos(th3),...
0.10*sin(th3)+0.6*cos(th3),...
-0.25*sin(th3)+0.8*cos(th3),...
0.10*sin(th3)+1.0*cos(th3),...
-0.25*sin(th3)+1.2*cos(th3),...
-0.03*sin(th3)+1.27*cos(th3),...
-0.03*sin(th3)+1.6*cos(th3),...
0.03*sin(th3)+1.6*cos(th3),...
0.03*sin(th3)+1.27*cos(th3),...
-0.10*sin(th3)+1.2*cos(th3),...
0.25*sin(th3)+1.0*cos(th3),...
-0.10*sin(th3)+0.8*cos(th3),...
0.25*sin(th3)+0.6*cos(th3),...
-0.10*sin(th3)+0.4*cos(th3),...
0.03*sin(th3)+0.33*cos(th3),...
0.03*sin(th3)];
yres_32=y03+[0.03*cos(th3),0.03*cos(th3)+0.33*sin(th3),...

```

```

0.25*cos(th3)+0.4*sin(th3),...
-0.10*cos(th3)+0.6*sin(th3),...
0.25*cos(th3)+0.8*sin(th3),...
-0.10*cos(th3)+1.0*sin(th3),...
0.25*cos(th3)+1.2*sin(th3),...
0.03*cos(th3)+1.27*sin(th3),...
0.03*cos(th3)+1.6*sin(th3),...
-0.03*cos(th3)+1.6*sin(th3),...
-0.03*cos(th3)+1.27*sin(th3),...
0.10*cos(th3)+1.2*sin(th3),...
-0.25*cos(th3)+1.0*sin(th3),...
0.10*cos(th3)+0.8*sin(th3),...
-0.25*cos(th3)+0.6*sin(th3),...
0.10*cos(th3)+0.4*sin(th3),...
-0.03*cos(th3)+0.33*sin(th3),...
-0.03*cos(th3)];

x04=-3.0;
y04=-2.5;
th4=pi/2;

xres_41=x04+[0.25*sin(th4),0.25*sin(th4)+1.6*cos(th4),...
-0.25*sin(th4)+1.6*cos(th4),-0.25*sin(th4)];
yres_41=y04+[-0.25*cos(th4),-0.25*cos(th4)+1.6*sin(th4),...
0.25*cos(th4)+1.6*sin(th4),0.25*cos(th4)];

xres_42=x04+[-0.03*sin(th4),-0.03*sin(th4)+0.33*cos(th4),...
-0.25*sin(th4)+0.4*cos(th4),...
0.10*sin(th4)+0.6*cos(th4),...
-0.25*sin(th4)+0.8*cos(th4),...
0.10*sin(th4)+1.0*cos(th4),...
-0.25*sin(th4)+1.2*cos(th4),...
-0.03*sin(th4)+1.27*cos(th4),...
-0.03*sin(th4)+1.6*cos(th4),...
0.03*sin(th4)+1.6*cos(th4),...
0.03*sin(th4)+1.27*cos(th4),...
-0.10*sin(th4)+1.2*cos(th4),...
0.25*sin(th4)+1.0*cos(th4),...
-0.10*sin(th4)+0.8*cos(th4),...
0.25*sin(th4)+0.6*cos(th4),...
-0.10*sin(th4)+0.4*cos(th4),...
0.03*sin(th4)+0.33*cos(th4),...
0.03*sin(th4)];
yres_42=y04+[0.03*cos(th4),0.03*cos(th4)+0.33*sin(th4),...
0.25*cos(th4)+0.4*sin(th4),...
-0.10*cos(th4)+0.6*sin(th4),...
0.25*cos(th4)+0.8*sin(th4),...
-0.10*cos(th4)+1.0*sin(th4),...
0.25*cos(th4)+1.2*sin(th4),...
0.03*cos(th4)+1.27*sin(th4),...
0.03*cos(th4)+1.6*sin(th4),...
-0.03*cos(th4)+1.6*sin(th4),...
-0.03*cos(th4)+1.27*sin(th4),...
0.10*cos(th4)+1.2*sin(th4),...
-0.25*cos(th4)+1.0*sin(th4),...
0.10*cos(th4)+0.8*sin(th4),...
-0.25*cos(th4)+0.6*sin(th4),...
0.10*cos(th4)+0.4*sin(th4),...
-0.03*cos(th4)+0.33*sin(th4),...
-0.03*cos(th4)];

x05=1.0;
y05=0.5;
th5=0;

xres_51=x05+[0.40*sin(th5),0.40*sin(th5)+1.2*cos(th5),...
-0.40*sin(th5)+1.2*cos(th5),-0.40*sin(th5)];
yres_51=y05+[-0.40*cos(th5),-0.40*cos(th5)+1.2*sin(th5),...
0.40*cos(th5)+1.2*sin(th5),0.40*cos(th5)];

xres_52=x05+[-0.05*sin(th5),-0.05*sin(th5)+0.25*cos(th5),...
-0.40*sin(th5)+0.3*cos(th5),...
0.25*sin(th5)+0.45*cos(th5),...
-0.40*sin(th5)+0.6*cos(th5),...
0.25*sin(th5)+0.75*cos(th5),...
-0.40*sin(th5)+0.9*cos(th5),...
-0.05*sin(th5)+0.95*cos(th5),...
-0.05*sin(th5)+1.2*cos(th5),...
0.05*sin(th5)+1.2*cos(th5),...
0.05*sin(th5)+0.95*cos(th5),...

```

```

-0.25*sin(th5)+0.9*cos(th5),...
0.40*sin(th5)+0.75*cos(th5),...
-0.25*sin(th5)+0.6*cos(th5),...
0.40*sin(th5)+0.45*cos(th5),...
-0.25*sin(th5)+0.3*cos(th5),...
0.05*sin(th5)+0.25*cos(th5),...
0.05*sin(th5)];
yres_52=y05+[0.05*cos(th5),0.05*cos(th5)+0.25*sin(th5),...
0.40*cos(th5)+0.3*sin(th5),...
-0.25*cos(th5)+0.45*sin(th5),...
0.40*cos(th5)+0.6*sin(th5),...
-0.250*cos(th5)+0.75*sin(th5),...
0.40*cos(th5)+0.9*sin(th5),...
0.05*cos(th5)+0.95*sin(th5),...
0.05*cos(th5)+1.2*sin(th5),...
-0.05*cos(th5)+1.2*sin(th5),...
-0.05*cos(th5)+0.95*sin(th5),...
0.25*cos(th5)+0.9*sin(th5),...
-0.40*cos(th5)+0.75*sin(th5),...
0.25*cos(th5)+0.6*sin(th5),...
-0.40*cos(th5)+0.45*sin(th5),...
0.25*cos(th5)+0.3*sin(th5),...
-0.05*cos(th5)+0.25*sin(th5),...
-0.05*cos(th5)];

x06=6.0;
y06=-2.5;
th6=pi/2;

xres_61=x06+[0.25*sin(th6),0.25*sin(th6)+1.6*cos(th6),...
-0.25*sin(th6)+1.6*cos(th6),-0.25*sin(th6)];
yres_61=y06+[-0.25*cos(th6),-0.25*cos(th6)+1.6*sin(th6),...
0.25*cos(th6)+1.6*sin(th6),0.25*cos(th6)];

xres_62=x06+[-0.03*sin(th6),-0.03*sin(th6)+0.33*cos(th6),...
-0.25*sin(th6)+0.4*cos(th6),...
0.10*sin(th6)+0.6*cos(th6),...
-0.25*sin(th6)+0.8*cos(th6),...
0.10*sin(th6)+1.0*cos(th6),...
-0.25*sin(th6)+1.2*cos(th6),...
-0.03*sin(th6)+1.27*cos(th6),...
-0.03*sin(th6)+1.6*cos(th6),...
0.03*sin(th6)+1.6*cos(th6),...
0.03*sin(th6)+1.27*cos(th6),...
-0.10*sin(th6)+1.2*cos(th6),...
0.25*sin(th6)+1.0*cos(th6),...
-0.10*sin(th6)+0.8*cos(th6),...
0.25*sin(th6)+0.6*cos(th6),...
-0.10*sin(th6)+0.4*cos(th6),...
0.03*sin(th6)+0.33*cos(th6),...
0.03*sin(th6)];
yres_62=y06+[0.03*cos(th6),0.03*cos(th6)+0.33*sin(th6),...
0.25*cos(th6)+0.4*sin(th6),...
-0.10*cos(th6)+0.6*sin(th6),...
0.25*cos(th6)+0.8*sin(th6),...
-0.10*cos(th6)+1.0*sin(th6),...
0.25*cos(th6)+1.2*sin(th6),...
0.03*cos(th6)+1.27*sin(th6),...
0.03*cos(th6)+1.6*sin(th6),...
-0.03*cos(th6)+1.6*sin(th6),...
-0.03*cos(th6)+1.27*sin(th6),...
0.10*cos(th6)+1.2*sin(th6),...
-0.25*cos(th6)+1.0*sin(th6),...
0.10*cos(th6)+0.8*sin(th6),...
-0.25*cos(th6)+0.6*sin(th6),...
0.10*cos(th6)+0.4*sin(th6),...
-0.03*cos(th6)+0.33*sin(th6),...
-0.03*cos(th6)];

x07=-9.5;
y07=0;

xv1_1=x07+[-1.0,1.0,1.0,-1.0];
yv1_1=y07+[-0.05,-0.05,0.05,0.05]+0.3;

xv1_2=x07+[-0.4,0.4,0.4,-0.4];
yv1_2=y07+[-0.1,-0.1,0.1,0.1]-0.1;

x08=6.0;

```

```

        y08=2.5;
        phi8=0:0.01:2*pi;

        xI1_1=x08+0.6*cos(phi8);
        yI1_1=y08+0.9*sin(phi8);

        xI1_2=x08+0.55*cos(phi8);
        yI1_2=y08+0.85*sin(phi8);

xI1_3=x08+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI1_3=y08+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

        x09=-6.0;
        y09=0.5;
        phi9=0:0.01:2*pi;

        xcable1=[-9.5,-9.5,-8,-8];
        ycable1=y02+[0.1,-0.1,-0.1,0.1];

        xcable2=[-9.55,-9.45,-9.45,-9.55];
        ycable2=[y02+0.1,y02+0.1,y07+0.35,y07+0.35];

        xcable3=[-9.55,-9.45,-9.45,-9.55];
        ycable3=[y01,y01,y07-0.2,y07-0.2];

        xcable4=[-9.5,-9.5,x01,x01];
        ycable4=y01+[0.1,-0.1,-0.1,0.1];

        xcable5=[9.5,9.5,x01,x01];
        ycable5=y01+[0.1,-0.1,-0.1,0.1];

        xcable6=[9.5,9.5,x02+1.2,x02+1.2];
        ycable6=y02+[0.1,-0.1,-0.1,0.1];

        xcable7=[-9.55,-9.45,-9.45,-9.55]+6.5;
        ycable7=[y02,y02,y03+1.6,y03+1.6];

        xcable8=[-9.55,-9.45,-9.45,-9.55]+6.5;
        ycable8=[y04+1.6,y04+1.6,y03,y03];

        xcable9=[-9.55,-9.45,-9.45,-9.55]+6.5;
        ycable9=[y04,y04,y01,y01];

        xcable10=[-3.0,-3.0,x05,x05];
        ycable10=y05+[0.1,-0.1,-0.1,0.1];

        xcable11=[x06,x06,x05+1.2,x05+1.2];
        ycable11=y05+[0.1,-0.1,-0.1,0.1];

        xcable12=[-9.55,-9.45,-9.45,-9.55]+15.5;
        ycable12=[y02,y02,y08+0.9,y08+0.9];

        xcable13=[-9.55,-9.45,-9.45,-9.55]+15.5;
        ycable13=[y06+1.6,y06+1.6,y08-0.9,y08-0.9];

        xcable14=[-9.55,-9.45,-9.45,-9.55]+15.5;
        ycable14=[y06,y06,y01,y01];

        xcable15=[-9.5,-9.5,x09,x09];
        ycable15=y02+[0.1,-0.1,-0.1,0.1]-2.0;

        xcable16=[-9.55,-9.45,-9.45,-9.55]+3.5;
        ycable16=[y02-1.9,y02-1.9,y09+0.9,y09+0.9];

        xcable17=[-9.55,-9.45,-9.45,-9.55]+3.5;
        ycable17=[y01,y01,y09-0.9,y09-0.9];

xI_1=x02+2.5+[0.0,0.0,1.0,1.0,1.5,1.0,1.0];
yI_1=y02+[0.1,-0.1,-0.1,-0.3,0.0,0.3,0.1];

        fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
        xres_21,yres_21,[1.0,1.0,1.0],...
        xres_22,yres_22,[0.0,0.0,0.0],...
        xres_31,yres_31,[1.0,1.0,1.0],...
        xres_32,yres_32,[0.0,0.0,0.0],...
        xres_41,yres_41,[1.0,1.0,1.0],...
        xres_42,yres_42,[0.0,0.0,0.0],...

```

```

xres_51,yres_51,[1.0,1.0,1.0],...
xres_52,yres_52,[0.0,0.0,0.0],...
xres_61,yres_61,[1.0,1.0,1.0],...
xres_62,yres_62,[0.0,0.0,0.0],...
xV1_1,yV1_1,[0.0,0.0,0.0],...
xV1_2,yV1_2,[0.0,0.0,0.0],...
xI1_1,yI1_1,[0.0,0.0,0.0],...
xI1_2,yI1_2,[1.0,1.0,1.0],...
xI1_3,yI1_3,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
xcable10,ycable10,[0.8,0.6,0.2],...
xcable11,ycable11,[0.8,0.6,0.2],...
xcable12,ycable12,[0.8,0.6,0.2],...
xcable13,ycable13,[0.8,0.6,0.2],...
xcable14,ycable14,[0.8,0.6,0.2],...
xI_1,yI_1,[0.0,0.0,0.0],...
'Linestyle','None')

text(-11,11,'Συνεπώς το αρχικό κύκλωμα γίνεται τώρα (R_{12}=R_{1}+R_{2})=')
text(-0.8,11.2,nR12)
text(-0.3,11.2,'Ohm). Μετασχηματίζουμε το τρίγωνο των αντιστάσεων R_{4}, R_{5}, R_{6}')
text(-11,10,'σε αστέρα. Θα έχουμε')
text(9.7,y02,'a','Color',[0.9,0.0,0.0])
text(9.7,y01,'b','Color',[0.9,0.0,0.0])
text(x02+0.5,y02+1.5,'R_{12}','Color',[0.9,0.2,0.0])
text(x03+0.5,y03+0.75,'R_3','Color',[0.9,0.2,0.0])
text(x04+0.5,y04+0.75,'R_4','Color',[0.9,0.2,0.0])
text(x05+0.5,y05-1.5,'R_5','Color',[0.9,0.2,0.0])
text(x06+0.5,y06+0.75,'R_6','Color',[0.9,0.2,0.0])
text(x07-0.75,y07+1.0,'V_{T1}','Color',[0.0,0.2,0.9])
text(x08+0.85,y08,'2I_1','Color',[0.0,0.2,0.9])
text(x02+3.0,y02-1.0,'I_1','Color',[0.0,0.2,0.9])

axis([-12,12,-12,12])
axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
elseif (snmeio==4)
axes(handles.axes1);
cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,9,9];

x01=-8.0;
y01=-5;
th1=0;

x02=-8.0;
y02=5;
th2=0;

xres_21=x02+[0.40*sin(th2),0.40*sin(th2)+1.2*cos(th2),...
-0.40*sin(th2)+1.2*cos(th2),-0.40*sin(th2)];
yres_21=y02+[-0.40*cos(th2),-0.40*cos(th2)+1.2*sin(th2),...
0.40*cos(th2)+1.2*sin(th2),0.40*cos(th2)];

xres_22=x02+[-0.05*sin(th2),-0.05*sin(th2)+0.25*cos(th2),...
-0.40*sin(th2)+0.3*cos(th2),...
0.25*sin(th2)+0.45*cos(th2),...
-0.40*sin(th2)+0.6*cos(th2),...
0.25*sin(th2)+0.75*cos(th2),...
-0.40*sin(th2)+0.9*cos(th2),...
-0.05*sin(th2)+0.95*cos(th2),...
-0.05*sin(th2)+1.2*cos(th2),...
0.05*sin(th2)+1.2*cos(th2),...
0.05*sin(th2)+0.95*cos(th2),...
-0.25*sin(th2)+0.9*cos(th2),...
0.40*sin(th2)+0.75*cos(th2),...

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-0.25*sin(th2)+0.6*cos(th2),...
0.40*sin(th2)+0.45*cos(th2),...
-0.25*sin(th2)+0.3*cos(th2),...
0.05*sin(th2)+0.25*cos(th2),...
0.05*sin(th2)];
yres_22=y02+[0.05*cos(th2),0.05*cos(th2)+0.25*sin(th2),...
0.40*cos(th2)+0.3*sin(th2),...
-0.25*cos(th2)+0.45*sin(th2),...
0.40*cos(th2)+0.6*sin(th2),...
-0.250*cos(th2)+0.75*sin(th2),...
0.40*cos(th2)+0.9*sin(th2),...
0.05*cos(th2)+0.95*sin(th2),...
0.05*cos(th2)+1.2*sin(th2),...
-0.05*cos(th2)+1.2*sin(th2),...
-0.05*cos(th2)+0.95*sin(th2),...
0.25*cos(th2)+0.9*sin(th2),...
-0.40*cos(th2)+0.75*sin(th2),...
0.25*cos(th2)+0.6*sin(th2),...
-0.40*cos(th2)+0.45*sin(th2),...
0.25*cos(th2)+0.3*sin(th2),...
-0.05*cos(th2)+0.25*sin(th2),...
-0.05*cos(th2)];

x03=-3.0;
y03=2.5;
th3=pi/2;

xres_31=x03+[0.25*sin(th3),0.25*sin(th3)+1.6*cos(th3),...
-0.25*sin(th3)+1.6*cos(th3),-0.25*sin(th3)];
yres_31=y03+[-0.25*cos(th3),-0.25*cos(th3)+1.6*sin(th3),...
0.25*cos(th3)+1.6*sin(th3),0.25*cos(th3)];

xres_32=x03+[-0.03*sin(th3),-0.03*sin(th3)+0.33*cos(th3),...
-0.25*sin(th3)+0.4*cos(th3),...
0.10*sin(th3)+0.6*cos(th3),...
-0.25*sin(th3)+0.8*cos(th3),...
0.10*sin(th3)+1.0*cos(th3),...
-0.25*sin(th3)+1.2*cos(th3),...
-0.03*sin(th3)+1.27*cos(th3),...
-0.03*sin(th3)+1.6*cos(th3),...
0.03*sin(th3)+1.6*cos(th3),...
0.03*sin(th3)+1.27*cos(th3),...
-0.10*sin(th3)+1.2*cos(th3),...
0.25*sin(th3)+1.0*cos(th3),...
-0.10*sin(th3)+0.8*cos(th3),...
0.25*sin(th3)+0.6*cos(th3),...
-0.10*sin(th3)+0.4*cos(th3),...
0.03*sin(th3)+0.33*cos(th3),...
0.03*sin(th3)];
yres_32=y03+[0.03*cos(th3),0.03*cos(th3)+0.33*sin(th3),...
0.25*cos(th3)+0.4*sin(th3),...
-0.10*cos(th3)+0.6*sin(th3),...
0.25*cos(th3)+0.8*sin(th3),...
-0.10*cos(th3)+1.0*sin(th3),...
0.25*cos(th3)+1.2*sin(th3),...
0.03*cos(th3)+1.27*sin(th3),...
0.03*cos(th3)+1.6*sin(th3),...
-0.03*cos(th3)+1.6*sin(th3),...
-0.03*cos(th3)+1.27*sin(th3),...
0.10*cos(th3)+1.2*sin(th3),...
-0.25*cos(th3)+1.0*sin(th3),...
0.10*cos(th3)+0.8*sin(th3),...
-0.25*cos(th3)+0.6*sin(th3),...
0.10*cos(th3)+0.4*sin(th3),...
-0.03*cos(th3)+0.33*sin(th3),...
-0.03*cos(th3)];

x04=1.5;
y04=-2.5;
th4=pi/2;

xres_41=x04+[0.25*sin(th4),0.25*sin(th4)+1.6*cos(th4),...
-0.25*sin(th4)+1.6*cos(th4),-0.25*sin(th4)];
yres_41=y04+[-0.25*cos(th4),-0.25*cos(th4)+1.6*sin(th4),...
0.25*cos(th4)+1.6*sin(th4),0.25*cos(th4)];

xres_42=x04+[-0.03*sin(th4),-0.03*sin(th4)+0.33*cos(th4),...
-0.25*sin(th4)+0.4*cos(th4),...
0.10*sin(th4)+0.6*cos(th4),...
-0.25*sin(th4)+0.8*cos(th4),...
0.10*sin(th4)+1.0*cos(th4),...

```



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-0.25*sin(th4)+1.2*cos(th4),...
-0.03*sin(th4)+1.27*cos(th4),...
-0.03*sin(th4)+1.6*cos(th4),...
0.03*sin(th4)+1.6*cos(th4),...
0.03*sin(th4)+1.27*cos(th4),...
-0.10*sin(th4)+1.2*cos(th4),...
0.25*sin(th4)+1.0*cos(th4),...
-0.10*sin(th4)+0.8*cos(th4),...
0.25*sin(th4)+0.6*cos(th4),...
-0.10*sin(th4)+0.4*cos(th4),...
0.03*sin(th4)+0.33*cos(th4),...
0.03*sin(th4)];
yres_42=y04+[0.03*cos(th4),0.03*cos(th4)+0.33*sin(th4),...
0.25*cos(th4)+0.4*sin(th4),...
-0.10*cos(th4)+0.6*sin(th4),...
0.25*cos(th4)+0.8*sin(th4),...
-0.10*cos(th4)+1.0*sin(th4),...
0.25*cos(th4)+1.2*sin(th4),...
0.03*cos(th4)+1.27*sin(th4),...
0.03*cos(th4)+1.6*sin(th4),...
-0.03*cos(th4)+1.6*sin(th4),...
-0.03*cos(th4)+1.27*sin(th4),...
0.10*cos(th4)+1.2*sin(th4),...
-0.25*cos(th4)+1.0*sin(th4),...
0.10*cos(th4)+0.8*sin(th4),...
-0.25*cos(th4)+0.6*sin(th4),...
0.10*cos(th4)+0.4*sin(th4),...
-0.03*cos(th4)+0.33*sin(th4),...
-0.03*cos(th4)];

x05=-1.0;
y05=0.5;
th5=0;

xres_51=x05+[0.40*sin(th5),0.40*sin(th5)+1.2*cos(th5),...
-0.40*sin(th5)+1.2*cos(th5),-0.40*sin(th5)];
yres_51=y05+[-0.40*cos(th5),-0.40*cos(th5)+1.2*sin(th5),...
0.40*cos(th5)+1.2*sin(th5),0.40*cos(th5)];

xres_52=x05+[-0.05*sin(th5),-0.05*sin(th5)+0.25*cos(th5),...
-0.40*sin(th5)+0.3*cos(th5),...
0.25*sin(th5)+0.45*cos(th5),...
-0.40*sin(th5)+0.6*cos(th5),...
0.25*sin(th5)+0.75*cos(th5),...
-0.40*sin(th5)+0.9*cos(th5),...
-0.05*sin(th5)+0.95*cos(th5),...
-0.05*sin(th5)+1.2*cos(th5),...
0.05*sin(th5)+1.2*cos(th5),...
0.05*sin(th5)+0.95*cos(th5),...
-0.25*sin(th5)+0.9*cos(th5),...
0.40*sin(th5)+0.75*cos(th5),...
-0.25*sin(th5)+0.6*cos(th5),...
0.40*sin(th5)+0.45*cos(th5),...
-0.25*sin(th5)+0.3*cos(th5),...
0.05*sin(th5)+0.25*cos(th5),...
0.05*sin(th5)];
yres_52=y05+[0.05*cos(th5),0.05*cos(th5)+0.25*sin(th5),...
0.40*cos(th5)+0.3*sin(th5),...
-0.25*cos(th5)+0.45*sin(th5),...
0.40*cos(th5)+0.6*sin(th5),...
-0.25*cos(th5)+0.75*sin(th5),...
0.40*cos(th5)+0.9*sin(th5),...
0.05*cos(th5)+0.95*sin(th5),...
0.05*cos(th5)+1.2*sin(th5),...
-0.05*cos(th5)+1.2*sin(th5),...
-0.05*cos(th5)+0.95*sin(th5),...
0.25*cos(th5)+0.9*sin(th5),...
-0.40*cos(th5)+0.75*sin(th5),...
0.25*cos(th5)+0.6*sin(th5),...
-0.40*cos(th5)+0.45*sin(th5),...
0.25*cos(th5)+0.3*sin(th5),...
-0.05*cos(th5)+0.25*sin(th5),...
-0.05*cos(th5)];

x05_1=3.0;
y05=0.5;
th5=0;

xres_51_1=x05_1+[0.40*sin(th5),0.40*sin(th5)+1.2*cos(th5),...
-0.40*sin(th5)+1.2*cos(th5),-0.40*sin(th5)];

```

```

yres_51_1=y05+[-0.40*cos(th5),-0.40*cos(th5)+1.2*sin(th5),...
0.40*cos(th5)+1.2*sin(th5),0.40*cos(th5)];

xres_52_1=x05_1+[-0.05*sin(th5),-0.05*sin(th5)+0.25*cos(th5),...
-0.40*sin(th5)+0.3*cos(th5),...
0.25*sin(th5)+0.45*cos(th5),...
-0.40*sin(th5)+0.6*cos(th5),...
0.25*sin(th5)+0.75*cos(th5),...
-0.40*sin(th5)+0.9*cos(th5),...
-0.05*sin(th5)+0.95*cos(th5),...
-0.05*sin(th5)+1.2*cos(th5),...
0.05*sin(th5)+1.2*cos(th5),...
0.05*sin(th5)+0.95*cos(th5),...
-0.25*sin(th5)+0.9*cos(th5),...
0.40*sin(th5)+0.75*cos(th5),...
-0.25*sin(th5)+0.6*cos(th5),...
0.40*sin(th5)+0.45*cos(th5),...
-0.25*sin(th5)+0.3*cos(th5),...
0.05*sin(th5)+0.25*cos(th5),...
0.05*sin(th5)];

yres_52_1=y05+[0.05*cos(th5),0.05*cos(th5)+0.25*sin(th5),...
0.40*cos(th5)+0.3*sin(th5),...
-0.25*cos(th5)+0.45*sin(th5),...
0.40*cos(th5)+0.6*sin(th5),...
-0.250*cos(th5)+0.75*sin(th5),...
0.40*cos(th5)+0.9*sin(th5),...
0.05*cos(th5)+0.95*sin(th5),...
0.05*cos(th5)+1.2*sin(th5),...
-0.05*cos(th5)+1.2*sin(th5),...
-0.05*cos(th5)+0.95*sin(th5),...
0.25*cos(th5)+0.9*sin(th5),...
-0.40*cos(th5)+0.75*sin(th5),...
0.25*cos(th5)+0.6*sin(th5),...
-0.40*cos(th5)+0.45*sin(th5),...
0.25*cos(th5)+0.3*sin(th5),...
-0.05*cos(th5)+0.25*sin(th5),...
-0.05*cos(th5)];

x06=6.0;
y06=-2.5;
th6=pi/2;

x07=-9.5;
y07=0;

xv1_1=x07+[-1.0,1.0,1.0,-1.0];
yv1_1=y07+[-0.05,-0.05,0.05,0.05]+0.3;

xv1_2=x07+[-0.4,0.4,0.4,-0.4];
yv1_2=y07+[-0.1,-0.1,0.1,0.1]-0.1;

x08=6.0;
y08=2.5;
phi8=0:0.01:2*pi;

xI1_1=x08+0.6*cos(phi8);
yI1_1=y08+0.9*sin(phi8);

xI1_2=x08+0.55*cos(phi8);
yI1_2=y08+0.85*sin(phi8);

xI1_3=x08+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI1_3=y08+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

x09=-6.0;
y09=0.5;
phi9=0:0.01:2*pi;

xcable1=[-9.5,-9.5,-8,-8];
ycable1=y02+[0.1,-0.1,-0.1,0.1];

xcable2=[-9.55,-9.45,-9.45,-9.55];
ycable2=[y02+0.1,y02+0.1,y07+0.35,y07+0.35];

xcable3=[-9.55,-9.45,-9.45,-9.55];
ycable3=[y01,y01,y07-0.2,y07-0.2];

xcable4=[-9.5,-9.5,x01,x01];

```

```

ycable4=y01+[0.1,-0.1,-0.1,0.1];

xcable5=[9.5,9.5,x01,x01];
ycable5=y01+[0.1,-0.1,-0.1,0.1];

xcable6=[9.5,9.5,x02+1.2,x02+1.2];
ycable6=y02+[0.1,-0.1,-0.1,0.1];

xcable7=[-9.55,-9.45,-9.45,-9.55]+6.5;
ycable7=[y02,y02,y03+1.6,y03+1.6];

xcable8=[-9.55,-9.45,-9.45,-9.55]+6.5;
ycable8=[y05-0.1,y05-0.1,y03,y03];

xcable9=[-9.55,-9.45,-9.45,-9.55]+6.5+3.0+1.5;
ycable9=[y04,y04,y01,y01];

xcable9_1=[-9.55,-9.45,-9.45,-9.55]+6.5+3.0+1.5;
ycable9_1=[y04+1.6,y04+1.6,y05-0.1,y05-0.1];

xcable10=[-3.0,-3.0,x05,x05];
ycable10=y05+[0.1,-0.1,-0.1,0.1];

xcable11=[x05_1,x05_1,x05+1.2,x05+1.2];
ycable11=y05+[0.1,-0.1,-0.1,0.1];

xcable11_1=[x06,x06,x05_1+1.2,x05_1+1.2];
ycable11_1=y05+[0.1,-0.1,-0.1,0.1];

xcable12=[-9.55,-9.45,-9.45,-9.55]+15.5;
ycable12=[y02,y02,y08+0.9,y08+0.9];

xcable13=[-9.55,-9.45,-9.45,-9.55]+15.5;
ycable13=[y05-0.1,y05-0.1,y08-0.9,y08-0.9];

xcable15=[-9.5,-9.5,x09,x09];
ycable15=y02+[0.1,-0.1,-0.1,0.1]-2.0;

xcable16=[-9.55,-9.45,-9.45,-9.55]+3.5;
ycable16=[y02-1.9,y02-1.9,y09+0.9,y09+0.9];

xcable17=[-9.55,-9.45,-9.45,-9.55]+3.5;
ycable17=[y01,y01,y09-0.9,y09-0.9];

xI_1=x02+2.5+[0.0,0.0,1.0,1.0,1.5,1.0,1.0];
yI_1=y02+[0.1,-0.1,-0.1,-0.3,0.0,0.3,0.1];

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_21,yres_21,[1.0,1.0,1.0],...
xres_22,yres_22,[0.0,0.0,0.0],...
xres_31,yres_31,[1.0,1.0,1.0],...
xres_32,yres_32,[0.0,0.0,0.0],...
xres_41,yres_41,[1.0,1.0,1.0],...
xres_42,yres_42,[0.0,0.0,0.0],...
xres_51,yres_51,[1.0,1.0,1.0],...
xres_52,yres_52,[0.0,0.0,0.0],...
xres_51_1,yres_51_1,[1.0,1.0,1.0],...
xres_52_1,yres_52_1,[0.0,0.0,0.0],...
xv1_1,yv1_1,[0.0,0.0,0.0],...
xv1_2,yv1_2,[0.0,0.0,0.0],...
xi1_1,yi1_1,[0.0,0.0,0.0],...
xi1_2,yi1_2,[1.0,1.0,1.0],...
xi1_3,yi1_3,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
xcable9_1,ycable9_1,[0.8,0.6,0.2],...
xcable10,ycable10,[0.8,0.6,0.2],...
xcable11,ycable11,[0.8,0.6,0.2],...
xcable11_1,ycable11_1,[0.8,0.6,0.2],...
xcable12,ycable12,[0.8,0.6,0.2],...
xcable13,ycable13,[0.8,0.6,0.2],...
xI_1,yI_1,[0.0,0.0,0.0],...

```

```

                                'LineStyle','None')
text(-11,11,'Θα έχουμε  $R_{45}=R_4R_5/(R_4+R_5+R_6)=$ ')
                                text(-4.5,11.2,nR45)
text(-3.8,11.0,'Ohm,  $R_{46}=R_4R_6/(R_4+R_5+R_6)=$ ')
                                text(2.0,11.2,nR46)
text(2.4,11.0,'Ohm,  $R_{56}=R_5R_6/(R_4+R_5+R_6)=$ ')
                                text(8.2,11.2,nR56)
                                text(9.1,11.2,'Ohm.')
text(-11,10,'Η αντίσταση  $R_{56}$  είναι σε σειρά με την πηγή ρεύματος  $2I_1$  και μπορεί να απαλειφθεί. Άρα θα
                                έχουμε')

                                text(9.7,y02,'a','Color',[0.9,0.0,0.0])
                                text(9.7,y01,'b','Color',[0.9,0.0,0.0])
                                text(x02+0.5,y02+1.5,' $R_{12}$ ','Color',[0.9,0.2,0.0])
                                text(x03+0.5,y03+0.75,' $R_3$ ','Color',[0.9,0.2,0.0])
                                text(x04+0.5,y04+0.75,' $R_{46}$ ','Color',[0.9,0.2,0.0])
                                text(x05+0.5,y05-1.5,' $R_{45}$ ','Color',[0.9,0.2,0.0])
                                text(x05+4.5,y05-1.5,' $R_{56}$ ','Color',[0.9,0.2,0.0])
                                text(x07-0.75,y07+1.0,' $V_{T1}$ ','Color',[0.0,0.2,0.9])
                                text(x08+0.85,y08,' $2I_1$ ','Color',[0.0,0.2,0.9])
                                text(x02+3.0,y02-1.0,' $I_1$ ','Color',[0.0,0.2,0.9])

                                axis([-12,12,-12,12])
                                axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
                                elseif (snmeio==5)
                                axes(handles.axes1);
                                cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
                                x_back=[-12,12,12,-12];
                                y_back=[-12,-12,12,12];

                                x_tableau=[-11,11,11,-11];
                                y_tableau=[-11,-11,8.5,8.5];

                                x01=-8.0;
                                y01=-5;
                                th1=0;

                                x02=-8.0;
                                y02=5;
                                th2=0;

                                xres_21=x02+[0.40*sin(th2),0.40*sin(th2)+1.2*cos(th2),...
                                -0.40*sin(th2)+1.2*cos(th2),-0.40*sin(th2)];
                                yres_21=y02+[-0.40*cos(th2),-0.40*cos(th2)+1.2*sin(th2),...
                                0.40*cos(th2)+1.2*sin(th2),0.40*cos(th2)];

                                xres_22=x02+[-0.05*sin(th2),-0.05*sin(th2)+0.25*cos(th2),...
                                -0.40*sin(th2)+0.3*cos(th2),...
                                0.25*sin(th2)+0.45*cos(th2),...
                                -0.40*sin(th2)+0.6*cos(th2),...
                                0.25*sin(th2)+0.75*cos(th2),...
                                -0.40*sin(th2)+0.9*cos(th2),...
                                -0.05*sin(th2)+0.95*cos(th2),...
                                -0.05*sin(th2)+1.2*cos(th2),...
                                0.05*sin(th2)+1.2*cos(th2),...
                                0.05*sin(th2)+0.95*cos(th2),...
                                -0.25*sin(th2)+0.9*cos(th2),...
                                0.40*sin(th2)+0.75*cos(th2),...
                                -0.25*sin(th2)+0.6*cos(th2),...
                                0.40*sin(th2)+0.45*cos(th2),...
                                -0.25*sin(th2)+0.3*cos(th2),...
                                0.05*sin(th2)+0.25*cos(th2),...
                                0.05*sin(th2)];
                                yres_22=y02+[0.05*cos(th2),0.05*cos(th2)+0.25*sin(th2),...
                                0.40*cos(th2)+0.3*sin(th2),...
                                -0.25*cos(th2)+0.45*sin(th2),...
                                0.40*cos(th2)+0.6*sin(th2),...
                                -0.250*cos(th2)+0.75*sin(th2),...
                                0.40*cos(th2)+0.9*sin(th2),...
                                0.05*cos(th2)+0.95*sin(th2),...
                                0.05*cos(th2)+1.2*sin(th2),...
                                -0.05*cos(th2)+1.2*sin(th2),...
                                -0.05*cos(th2)+0.95*sin(th2),...
                                0.25*cos(th2)+0.9*sin(th2),...
                                -0.40*cos(th2)+0.75*sin(th2),...
                                0.25*cos(th2)+0.6*sin(th2),...
                                0.25*cos(th2)+0.6*sin(th2),...

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-0.40*cos(th2)+0.45*sin(th2),...
0.25*cos(th2)+0.3*sin(th2),...
-0.05*cos(th2)+0.25*sin(th2),...
-0.05*cos(th2)];

x03=-3.0;
y03=2.5;
th3=pi/2;

xres_31=x03+[0.25*sin(th3),0.25*sin(th3)+1.6*cos(th3),...
-0.25*sin(th3)+1.6*cos(th3),-0.25*sin(th3)];
yres_31=y03+[-0.25*cos(th3),-0.25*cos(th3)+1.6*sin(th3),...
0.25*cos(th3)+1.6*sin(th3),0.25*cos(th3)];

xres_32=x03+[-0.03*sin(th3),-0.03*sin(th3)+0.33*cos(th3),...
-0.25*sin(th3)+0.4*cos(th3),...
0.10*sin(th3)+0.6*cos(th3),...
-0.25*sin(th3)+0.8*cos(th3),...
0.10*sin(th3)+1.0*cos(th3),...
-0.25*sin(th3)+1.2*cos(th3),...
-0.03*sin(th3)+1.27*cos(th3),...
-0.03*sin(th3)+1.6*cos(th3),...
0.03*sin(th3)+1.6*cos(th3),...
0.03*sin(th3)+1.27*cos(th3),...
-0.10*sin(th3)+1.2*cos(th3),...
0.25*sin(th3)+1.0*cos(th3),...
-0.10*sin(th3)+0.8*cos(th3),...
0.25*sin(th3)+0.6*cos(th3),...
-0.10*sin(th3)+0.4*cos(th3),...
0.03*sin(th3)+0.33*cos(th3),...
0.03*sin(th3)];
yres_32=y03+[0.03*cos(th3),0.03*cos(th3)+0.33*sin(th3),...
0.25*cos(th3)+0.4*sin(th3),...
-0.10*cos(th3)+0.6*sin(th3),...
0.25*cos(th3)+0.8*sin(th3),...
-0.10*cos(th3)+1.0*sin(th3),...
0.25*cos(th3)+1.2*sin(th3),...
0.03*cos(th3)+1.27*sin(th3),...
0.03*cos(th3)+1.6*sin(th3),...
-0.03*cos(th3)+1.6*sin(th3),...
-0.03*cos(th3)+1.27*sin(th3),...
0.10*cos(th3)+1.2*sin(th3),...
-0.25*cos(th3)+1.0*sin(th3),...
0.10*cos(th3)+0.8*sin(th3),...
-0.25*cos(th3)+0.6*sin(th3),...
0.10*cos(th3)+0.4*sin(th3),...
-0.03*cos(th3)+0.33*sin(th3),...
-0.03*cos(th3)];

x04=-3.0;
y04=-2.5;
th4=pi/2;

xres_41=x04+[0.25*sin(th4),0.25*sin(th4)+1.6*cos(th4),...
-0.25*sin(th4)+1.6*cos(th4),-0.25*sin(th4)];
yres_41=y04+[-0.25*cos(th4),-0.25*cos(th4)+1.6*sin(th4),...
0.25*cos(th4)+1.6*sin(th4),0.25*cos(th4)];

xres_42=x04+[-0.03*sin(th4),-0.03*sin(th4)+0.33*cos(th4),...
-0.25*sin(th4)+0.4*cos(th4),...
0.10*sin(th4)+0.6*cos(th4),...
-0.25*sin(th4)+0.8*cos(th4),...
0.10*sin(th4)+1.0*cos(th4),...
-0.25*sin(th4)+1.2*cos(th4),...
-0.03*sin(th4)+1.27*cos(th4),...
-0.03*sin(th4)+1.6*cos(th4),...
0.03*sin(th4)+1.6*cos(th4),...
0.03*sin(th4)+1.27*cos(th4),...
-0.10*sin(th4)+1.2*cos(th4),...
0.25*sin(th4)+1.0*cos(th4),...
-0.10*sin(th4)+0.8*cos(th4),...
0.25*sin(th4)+0.6*cos(th4),...
-0.10*sin(th4)+0.4*cos(th4),...
0.03*sin(th4)+0.33*cos(th4),...
0.03*sin(th4)];
yres_42=y04+[0.03*cos(th4),0.03*cos(th4)+0.33*sin(th4),...
0.25*cos(th4)+0.4*sin(th4),...
-0.10*cos(th4)+0.6*sin(th4),...
0.25*cos(th4)+0.8*sin(th4),...
-0.10*cos(th4)+1.0*sin(th4),...
0.25*cos(th4)+1.2*sin(th4),...

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0.03*cos(th4)+1.27*sin(th4),...
0.03*cos(th4)+1.6*sin(th4),...
-0.03*cos(th4)+1.6*sin(th4),...
-0.03*cos(th4)+1.27*sin(th4),...
0.10*cos(th4)+1.2*sin(th4),...
-0.25*cos(th4)+1.0*sin(th4),...
0.10*cos(th4)+0.8*sin(th4),...
-0.25*cos(th4)+0.6*sin(th4),...
0.10*cos(th4)+0.4*sin(th4),...
-0.03*cos(th4)+0.33*sin(th4),...
-0.03*cos(th4)];

x05=1.0;
y05=0.5;
th5=0;

x06=6.0;
y06=-2.5;
th6=pi/2;

x07=-9.5;
y07=0;

xV1_1=x07+[-1.0,1.0,1.0,-1.0];
yV1_1=y07+[-0.05,-0.05,0.05,0.05]+0.3;

xV1_2=x07+[-0.4,0.4,0.4,-0.4];
yV1_2=y07+[-0.1,-0.1,0.1,0.1]-0.1;

x08=6.0;
y08=2.5;
phi8=0:0.01:2*pi;

xI1_1=x08+0.6*cos(phi8);
yI1_1=y08+0.9*sin(phi8);

xI1_2=x08+0.55*cos(phi8);
yI1_2=y08+0.85*sin(phi8);

xI1_3=x08+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI1_3=y08+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

x09=-6.0;
y09=0.5;
phi9=0:0.01:2*pi;

xcable1=[-9.5,-9.5,-8,-8];
ycable1=y02+[0.1,-0.1,-0.1,0.1];

xcable2=[-9.55,-9.45,-9.45,-9.55];
ycable2=[y02+0.1,y02+0.1,y07+0.35,y07+0.35];

xcable3=[-9.55,-9.45,-9.45,-9.55];
ycable3=[y01,y01,y07-0.2,y07-0.2];

xcable4=[-9.5,-9.5,x01,x01];
ycable4=y01+[0.1,-0.1,-0.1,0.1];

xcable5=[9.5,9.5,x01,x01];
ycable5=y01+[0.1,-0.1,-0.1,0.1];

xcable6=[9.5,9.5,x02+1.2,x02+1.2];
ycable6=y02+[0.1,-0.1,-0.1,0.1];

xcable7=[-9.55,-9.45,-9.45,-9.55]+6.5;
ycable7=[y02,y02,y03+1.6,y03+1.6];

xcable8=[-9.55,-9.45,-9.45,-9.55]+6.5;
ycable8=[y04+1.6,y04+1.6,y03,y03];

xcable9=[-9.55,-9.45,-9.45,-9.55]+6.5;
ycable9=[y04,y04,y01,y01];

xcable10=[-3.0,-3.0,x05,x05];
ycable10=y05+[0.1,-0.1,-0.1,0.1];

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xcable11=[x06,x06,x05,x05];
ycable11=y05+[0.1,-0.1,-0.1,0.1];

xcable12=[-9.55,-9.45,-9.45,-9.55]+15.5;
ycable12=[y02,y02,y08+0.9,y08+0.9];

xcable13=[-9.55,-9.45,-9.45,-9.55]+15.5;
ycable13=[y05-0.1,y05-0.1,y08-0.9,y08-0.9];

xI_1=x02+2.5+[0.0,0.0,1.0,1.0,1.5,1.0,1.0];
yI_1=y02+[0.1,-0.1,-0.1,-0.3,0.0,0.3,0.1];

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_21,yres_21,[1.0,1.0,1.0],...
xres_22,yres_22,[0.0,0.0,0.0],...
xres_31,yres_31,[1.0,1.0,1.0],...
xres_32,yres_32,[0.0,0.0,0.0],...
xres_41,yres_41,[1.0,1.0,1.0],...
xres_42,yres_42,[0.0,0.0,0.0],...
xV1_1,yV1_1,[0.0,0.0,0.0],...
xV1_2,yV1_2,[0.0,0.0,0.0],...
xI1_1,yI1_1,[0.0,0.0,0.0],...
xI1_2,yI1_2,[1.0,1.0,1.0],...
xI1_3,yI1_3,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
xcable10,ycable10,[0.8,0.6,0.2],...
xcable11,ycable11,[0.8,0.6,0.2],...
xcable12,ycable12,[0.8,0.6,0.2],...
xcable13,ycable13,[0.8,0.6,0.2],...
xI_1,yI_1,[0.0,0.0,0.0],...
'Linestyle','None')

text(-11,11,'Θα είναι  $R_{345}=R_{3}+R_{45}='$ )
text(-6.5,11.2,nR345)
text(-5.8,11.2,'Ohm. Αντικαθιστούμε την αντίσταση  $R_{345}$  και την πηγή ρεύματος  $2I_1$ , με το ισοδυναμίο τους ')
text(-11,10,'κατά Thevenin. Επίσης βραχυκυκλώνουμε τα άκρα a,b με ρεύμα βραχυκύκλωσης  $I_{(N)}$ . Στο επόμενο
κύκλωμα θα έχουμε ότι')
text(-11,9,' $V_{2}='$ )
text(-10.2,9.2,ndR345)
text(-9.9,9.0,' $I_{1}$  Volt, και  $R_{3456}=R_{3}+R_{45}+R_{46}='$ )
text(-3.8,9.2,nR3456)
text(-3.2,9.2,'Ohm.')R_{12}','Color',[0.9,0.2,0.0])
text(x03+0.5,y03+0.75,' $R_{345}$ ','Color',[0.9,0.2,0.0])
text(x04+0.5,y04+0.75,' $R_{46}$ ','Color',[0.9,0.2,0.0])
text(x07-0.75,y07+1.0,' $V_{T1}$ ','Color',[0.0,0.2,0.9])
text(x08+0.85,y08,' $2I_1$ ','Color',[0.0,0.2,0.9])
text(x02+3.0,y02-1.0,' $I_1$ ','Color',[0.0,0.2,0.9])

axis([-12,12,-12,12])
axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
elseif (snmeio==6)
axes(handles.axes1);
cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,8.5,8.5];

x01=-8.0;
y01=-5;
th1=0;

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x02=-8.0;
y02=5;
th2=0;

xres_21=x02+[0.40*sin(th2),0.40*sin(th2)+1.2*cos(th2),...
-0.40*sin(th2)+1.2*cos(th2),-0.40*sin(th2)];
yres_21=y02+[-0.40*cos(th2),-0.40*cos(th2)+1.2*sin(th2),...
0.40*cos(th2)+1.2*sin(th2),0.40*cos(th2)];

xres_22=x02+[-0.05*sin(th2),-0.05*sin(th2)+0.25*cos(th2),...
-0.40*sin(th2)+0.3*cos(th2),...
0.25*sin(th2)+0.45*cos(th2),...
-0.40*sin(th2)+0.6*cos(th2),...
0.25*sin(th2)+0.75*cos(th2),...
-0.40*sin(th2)+0.9*cos(th2),...
-0.05*sin(th2)+0.95*cos(th2),...
-0.05*sin(th2)+1.2*cos(th2),...
0.05*sin(th2)+1.2*cos(th2),...
0.05*sin(th2)+0.95*cos(th2),...
-0.25*sin(th2)+0.9*cos(th2),...
0.40*sin(th2)+0.75*cos(th2),...
-0.25*sin(th2)+0.6*cos(th2),...
0.40*sin(th2)+0.45*cos(th2),...
-0.25*sin(th2)+0.3*cos(th2),...
0.05*sin(th2)+0.25*cos(th2),...
0.05*sin(th2)];
yres_22=y02+[0.05*cos(th2),0.05*cos(th2)+0.25*sin(th2),...
0.40*cos(th2)+0.3*sin(th2),...
-0.25*cos(th2)+0.45*sin(th2),...
0.40*cos(th2)+0.6*sin(th2),...
-0.250*cos(th2)+0.75*sin(th2),...
0.40*cos(th2)+0.9*sin(th2),...
0.05*cos(th2)+0.95*sin(th2),...
0.05*cos(th2)+1.2*sin(th2),...
-0.05*cos(th2)+1.2*sin(th2),...
-0.05*cos(th2)+0.95*sin(th2),...
0.25*cos(th2)+0.9*sin(th2),...
-0.40*cos(th2)+0.75*sin(th2),...
0.25*cos(th2)+0.6*sin(th2),...
-0.40*cos(th2)+0.45*sin(th2),...
0.25*cos(th2)+0.3*sin(th2),...
-0.05*cos(th2)+0.25*sin(th2),...
-0.05*cos(th2)];

x03=-3.0;
y03=2.5;
th3=pi/2;

x04=-3.0;
y04=-2.5;
th4=pi/2;

xres_41=x04+[0.25*sin(th4),0.25*sin(th4)+1.6*cos(th4),...
-0.25*sin(th4)+1.6*cos(th4),-0.25*sin(th4)];
yres_41=y04+[-0.25*cos(th4),-0.25*cos(th4)+1.6*sin(th4),...
0.25*cos(th4)+1.6*sin(th4),0.25*cos(th4)];

xres_42=x04+[-0.03*sin(th4),-0.03*sin(th4)+0.33*cos(th4),...
-0.25*sin(th4)+0.4*cos(th4),...
0.10*sin(th4)+0.6*cos(th4),...
-0.25*sin(th4)+0.8*cos(th4),...
0.10*sin(th4)+1.0*cos(th4),...
-0.25*sin(th4)+1.2*cos(th4),...
-0.03*sin(th4)+1.27*cos(th4),...
-0.03*sin(th4)+1.6*cos(th4),...
0.03*sin(th4)+1.6*cos(th4),...
0.03*sin(th4)+1.27*cos(th4),...
-0.10*sin(th4)+1.2*cos(th4),...
0.25*sin(th4)+1.0*cos(th4),...
-0.10*sin(th4)+0.8*cos(th4),...
0.25*sin(th4)+0.6*cos(th4),...
-0.10*sin(th4)+0.4*cos(th4),...
0.03*sin(th4)+0.33*cos(th4),...
0.03*sin(th4)];
yres_42=y04+[0.03*cos(th4),0.03*cos(th4)+0.33*sin(th4),...
0.25*cos(th4)+0.4*sin(th4),...
-0.10*cos(th4)+0.6*sin(th4),...
0.25*cos(th4)+0.8*sin(th4),...
-0.10*cos(th4)+1.0*sin(th4),...
0.25*cos(th4)+1.2*sin(th4),...
0.25*cos(th4)+1.2*sin(th4),...

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0.03*cos(th4)+1.27*sin(th4),...
0.03*cos(th4)+1.6*sin(th4),...
-0.03*cos(th4)+1.6*sin(th4),...
-0.03*cos(th4)+1.27*sin(th4),...
0.10*cos(th4)+1.2*sin(th4),...
-0.25*cos(th4)+1.0*sin(th4),...
0.10*cos(th4)+0.8*sin(th4),...
-0.25*cos(th4)+0.6*sin(th4),...
0.10*cos(th4)+0.4*sin(th4),...
-0.03*cos(th4)+0.33*sin(th4),...
-0.03*cos(th4)];

x05=1.0;
y05=0.5;
th5=0;

x06=6.0;
y06=-2.5;
th6=pi/2;

x07=-9.5;
y07=0;

xV1_1=x07+[-1.0,1.0,1.0,-1.0];
yV1_1=y07+[-0.05,-0.05,0.05,0.05]+0.3;

xV1_2=x07+[-0.4,0.4,0.4,-0.4];
yV1_2=y07+[-0.1,-0.1,0.1,0.1]-0.1;

x08=6.0;
y08=2.5;
phi8=0:0.01:2*pi;

x09=-6.0;
y09=0.5;
phi9=0:0.01:2*pi;

x010=-3.0;
y010=y03+0.2;

xV2_1=x010+[-1.0,1.0,1.0,-1.0];
yV2_1=y010+[-0.05,-0.05,0.05,0.05]+0.3;

xV2_2=x010+[-0.4,0.4,0.4,-0.4];
yV2_2=y010+[-0.1,-0.1,0.1,0.1]-0.1;

xcable1=[-9.5,-9.5,-8,-8];
ycable1=y02+[0.1,-0.1,-0.1,0.1];

xcable2=[-9.55,-9.45,-9.45,-9.55];
ycable2=[y02+0.1,y02+0.1,y07+0.35,y07+0.35];

xcable3=[-9.55,-9.45,-9.45,-9.55];
ycable3=[y01,y01,y07-0.2,y07-0.2];

xcable4=[-9.5,-9.5,x01,x01];
ycable4=y01+[0.1,-0.1,-0.1,0.1];

xcable5=[9.5,9.5,x01,x01];
ycable5=y01+[0.1,-0.1,-0.1,0.1];

xcable6=[9.5,9.5,x02+1.2,x02+1.2];
ycable6=y02+[0.1,-0.1,-0.1,0.1];

xcable7=[-9.55,-9.45,-9.45,-9.55]+6.5;
ycable7=[y02,y02,y010+0.35,y010+0.35];

xcable8=[-9.55,-9.45,-9.45,-9.55]+6.5;
ycable8=[y04+1.6,y04+1.6,y03,y03];

xcable9=[-9.55,-9.45,-9.45,-9.55]+6.5;
ycable9=[y04,y04,y01,y01];

xcable14=[9.45,9.55,9.55,9.45];
ycable14=[y01-0.1,y01-0.1,y02+0.1,y02+0.1];

```

```

xI_1=x02+2.5+[0.0,0.0,1.0,1.0,1.5,1.0,1.0];
yI_1=y02+[0.1,-0.1,-0.1,-0.3,0.0,0.3,0.1];

xI_2=x04+[-0.05,0.05,0.05,0.3,0.0,-0.3,-0.05];
yI_2=y01+0.5+[0.0,0.0,1.0,1.0,1.5,1.0,1.0];

xI_3=9.5+[-0.05,0.05,0.05,0.3,0.0,-0.3,-0.05];
yI_3=y01+4.5+[0.0,0.0,1.0,1.0,1.5,1.0,1.0];

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_21,yres_21,[1.0,1.0,1.0],...
xres_22,yres_22,[0.0,0.0,0.0],...
xres_41,yres_41,[1.0,1.0,1.0],...
xres_42,yres_42,[0.0,0.0,0.0],...
xV1_1,yV1_1,[0.0,0.0,0.0],...
xV1_2,yV1_2,[0.0,0.0,0.0],...
xV2_1,yV2_1,[0.0,0.0,0.0],...
xV2_2,yV2_2,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
xcable14,ycable14,[0.8,0.6,0.2],...
xI_1,yI_1,[0.0,0.0,0.0],...
xI_2,yI_2,[0.0,0.0,0.0],...
xI_3,yI_3,[0.0,0.0,0.0],...
'Linestyle','None')

text(-11,11,'Από τον βρόχο χωρίς την ύπαρξη της βραχυκύκλωσης των άκρων a,b, έχουμε  $V_{\{T1\}}-I_{\{1\}}R_{\{12\}}-V_{\{2\}}-I_{\{1\}}R_{\{3456\}}=0.$ ')
text(7,11,'Αρα  $I_{\{1\}}=$ ')
text(8.5,11.2,nI1)
text(9.5,11.2,'A.')
text(-11,10,'Αρα η τάση Thevenin θα είναι  $V_{\{ab\}}=V_{\{T\}}=V_{\{2\}}+R_{\{3456\}}I_{\{1\}}=$ ')
text(-1.4,10.2,nVT)
text(-0.4,10.2,'Volt. Το ρεύμα βραχυκύκλωσης θα είναι ')
text(-11,9.0,' $I_{\{N\}}=I_{\{1\}}+I_{\{2\}}=(V_{\{T1\}}/R_{\{12\}})+(V_{\{2\}}/R_{\{3456\}})=$ ')
text(-5.2,9.0,nIN)
text(-4.4,9.0,'A. Αρα η αντίσταση Thevenin θα είναι  $R_{\{T\}}=V_{\{T\}}/I_{\{N\}}=$ ')
text(4.7,9.2,nRT)
text(5.8,9.2,'Ohm. ')

text(9.7,y02,'a','Color',[0.9,0.0,0.0])
text(9.7,y01,'b','Color',[0.9,0.0,0.0])
text(x02+0.5,y02+1.5,'R_{12}','Color',[0.9,0.2,0.0])
text(x03+0.5,y03+1.25,'V_{2}','Color',[0.0,0.2,0.9])
text(x04+0.5,y04+0.75,'R_{3456}','Color',[0.9,0.2,0.0])
text(x07-0.75,y07+1.0,'V_{T1}','Color',[0.0,0.2,0.9])
text(x02+3.0,y02-1.0,'I_1','Color',[0.0,0.2,0.9])
text(x04+0.5,y01+1.0,'I_2','Color',[0.0,0.2,0.9])
text(9.5+0.5,y01+5.0,'I_N','Color',[0.0,0.2,0.9])

axis([-12,12,-12,12])
axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
else
end

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

% --- Executes on button press in pushbutton4.
function pushbutton4_Callback(hObject, eventdata, handles)
% hObject handle to pushbutton4 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)
hfin=questdlg('Εξοδος από το πρόγραμμα?');
switch hfin
case 'Yes'
closereq;
end

```

Ασκηση 5

```
function varargout = g_asknsn_5(varargin)
% G_ASKNSN_5 M-file for g_asknsn_5.fig
% G_ASKNSN_5, by itself, creates a new G_ASKNSN_5 or raises the existing
% singleton*.
%
% H = G_ASKNSN_5 returns the handle to a new G_ASKNSN_5 or the handle to
% the existing singleton*.
%
% G_ASKNSN_5('CALLBACK',hObject,eventData,handles,...) calls the local
% function named CALLBACK in G_ASKNSN_5.M with the given input arguments.
%
% G_ASKNSN_5('Property','Value',...) creates a new G_ASKNSN_5 or raises the
% existing singleton*. Starting from the left, property value pairs are
% applied to the GUI before g_asknsn_5_OpeningFcn gets called. An
% unrecognized property name or invalid value makes property application
% stop. All inputs are passed to g_asknsn_5_OpeningFcn via varargin.
%
% *See GUI Options on GUIDE's Tools menu. Choose "GUI allows only one
% instance to run (singleton)".
%
% See also: GUIDE, GUIDATA, GUIHANDLES

% Edit the above text to modify the response to help g_asknsn_5

% Last Modified by GUIDE v2.5 14-Dec-2013 22:46:23

% Begin initialization code - DO NOT EDIT
gui_Singleton = 1;
gui_State = struct('gui_Name',       mfilename, ...
                  'gui_Singleton',   gui_Singleton, ...
                  'gui_OpeningFcn', @g_asknsn_5_OpeningFcn, ...
                  'gui_OutputFcn',  @g_asknsn_5_OutputFcn, ...
                  'gui_LayoutFcn',   [], ...
                  'gui_Callback',    []);
if nargin && ischar(varargin{1})
    gui_State.gui_Callback = str2func(varargin{1});
end

if nargout
    [varargout{1:nargout}] = gui_mainfcn(gui_State, varargin{:});
else
    gui_mainfcn(gui_State, varargin{:});
end
% End initialization code - DO NOT EDIT

% --- Executes just before g_asknsn_5 is made visible.
function g_asknsn_5_OpeningFcn(hObject, eventdata, handles, varargin)
% This function has no output args, see OutputFcn.
% hObject    handle to figure
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
% varargin   command line arguments to g_asknsn_5 (see VARARGIN)

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,9,9];

x01=-1;
y01=2;
th1=0;

xres_11=x01+[0.40*sin(th1),0.40*sin(th1)+1.2*cos(th1),...
            -0.40*sin(th1)+1.2*cos(th1),-0.40*sin(th1)];
yres_11=y01+[-0.40*cos(th1),-0.40*cos(th1)+1.2*sin(th1),...
            0.40*cos(th1)+1.2*sin(th1),0.40*cos(th1)];

xres_12=x01+[-0.05*sin(th1),-0.05*sin(th1)+0.25*cos(th1),...
            -0.40*sin(th1)+0.3*cos(th1),...
            0.25*sin(th1)+0.45*cos(th1),...
            -0.40*sin(th1)+0.6*cos(th1),...];
```

```

0.25*sin(th1)+0.75*cos(th1),...
-0.40*sin(th1)+0.9*cos(th1),...
-0.05*sin(th1)+0.95*cos(th1),...
-0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+0.95*cos(th1),...
-0.25*sin(th1)+0.9*cos(th1),...
0.40*sin(th1)+0.75*cos(th1),...
-0.25*sin(th1)+0.6*cos(th1),...
0.40*sin(th1)+0.45*cos(th1),...
-0.25*sin(th1)+0.3*cos(th1),...
0.05*sin(th1)+0.25*cos(th1),...
0.05*sin(th1)];
yres_12=y01+[0.05*cos(th1),0.05*cos(th1)+0.25*sin(th1),...
0.40*cos(th1)+0.3*sin(th1),...
-0.25*cos(th1)+0.45*sin(th1),...
0.40*cos(th1)+0.6*sin(th1),...
-0.250*cos(th1)+0.75*sin(th1),...
0.40*cos(th1)+0.9*sin(th1),...
0.05*cos(th1)+0.95*sin(th1),...
0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+0.95*sin(th1),...
0.25*cos(th1)+0.9*sin(th1),...
-0.40*cos(th1)+0.75*sin(th1),...
0.25*cos(th1)+0.6*sin(th1),...
-0.40*cos(th1)+0.45*sin(th1),...
0.25*cos(th1)+0.3*sin(th1),...
-0.05*cos(th1)+0.25*sin(th1),...
-0.05*cos(th1)];
x02=-5;
y02=-1;
th2=pi/2;

xres_21=x02+[0.25*sin(th2),0.25*sin(th2)+1.6*cos(th2),...
-0.25*sin(th2)+1.6*cos(th2),-0.25*sin(th2)];
yres_21=y02+[-0.25*cos(th2),-0.25*cos(th2)+1.6*sin(th2),...
0.25*cos(th2)+1.6*sin(th2),0.25*cos(th2)];

xres_22=x02+[-0.03*sin(th2),-0.03*sin(th2)+0.33*cos(th2),...
-0.25*sin(th2)+0.4*cos(th2),...
0.10*sin(th2)+0.6*cos(th2),...
-0.25*sin(th2)+0.8*cos(th2),...
0.10*sin(th2)+1.0*cos(th2),...
-0.25*sin(th2)+1.2*cos(th2),...
-0.03*sin(th2)+1.27*cos(th2),...
-0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.27*cos(th2),...
-0.10*sin(th2)+1.2*cos(th2),...
0.25*sin(th2)+1.0*cos(th2),...
-0.10*sin(th2)+0.8*cos(th2),...
0.25*sin(th2)+0.6*cos(th2),...
-0.10*sin(th2)+0.4*cos(th2),...
0.03*sin(th2)+0.33*cos(th2),...
0.03*sin(th2)];
yres_22=y02+[0.03*cos(th2),0.03*cos(th2)+0.33*sin(th2),...
0.25*cos(th2)+0.4*sin(th2),...
-0.10*cos(th2)+0.6*sin(th2),...
0.25*cos(th2)+0.8*sin(th2),...
-0.10*cos(th2)+1.0*sin(th2),...
0.25*cos(th2)+1.2*sin(th2),...
0.03*cos(th2)+1.27*sin(th2),...
0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.27*sin(th2),...
0.10*cos(th2)+1.2*sin(th2),...
-0.25*cos(th2)+1.0*sin(th2),...
0.10*cos(th2)+0.8*sin(th2),...
-0.25*cos(th2)+0.6*sin(th2),...
0.10*cos(th2)+0.4*sin(th2),...
-0.03*cos(th2)+0.33*sin(th2),...
-0.03*cos(th2)];
x03=3.5;
y03=-2;
th3=pi/2;

xres_31=x03+[0.25*sin(th3),0.25*sin(th3)+1.6*cos(th3),...
-0.25*sin(th3)+1.6*cos(th3),-0.25*sin(th3)];
yres_31=y03+[-0.25*cos(th3),-0.25*cos(th3)+1.6*sin(th3),...

```

```

0.25*cos(th3)+1.6*sin(th3),0.25*cos(th3)];

xres_32=x03+[-0.03*sin(th3),-0.03*sin(th3)+0.33*cos(th3),...
-0.25*sin(th3)+0.4*cos(th3),...
0.10*sin(th3)+0.6*cos(th3),...
-0.25*sin(th3)+0.8*cos(th3),...
0.10*sin(th3)+1.0*cos(th3),...
-0.25*sin(th3)+1.2*cos(th3),...
-0.03*sin(th3)+1.27*cos(th3),...
-0.03*sin(th3)+1.6*cos(th3),...
0.03*sin(th3)+1.6*cos(th3),...
0.03*sin(th3)+1.27*cos(th3),...
-0.10*sin(th3)+1.2*cos(th3),...
0.25*sin(th3)+1.0*cos(th3),...
-0.10*sin(th3)+0.8*cos(th3),...
0.25*sin(th3)+0.6*cos(th3),...
-0.10*sin(th3)+0.4*cos(th3),...
0.03*sin(th3)+0.33*cos(th3),...
0.03*sin(th3)];
yres_32=y03+[0.03*cos(th3),0.03*cos(th3)+0.33*sin(th3),...
0.25*cos(th3)+0.4*sin(th3),...
-0.10*cos(th3)+0.6*sin(th3),...
0.25*cos(th3)+0.8*sin(th3),...
-0.10*cos(th3)+1.0*sin(th3),...
0.25*cos(th3)+1.2*sin(th3),...
0.03*cos(th3)+1.27*sin(th3),...
0.03*cos(th3)+1.6*sin(th3),...
-0.03*cos(th3)+1.6*sin(th3),...
-0.03*cos(th3)+1.27*sin(th3),...
0.10*cos(th3)+1.2*sin(th3),...
-0.25*cos(th3)+1.0*sin(th3),...
0.10*cos(th3)+0.8*sin(th3),...
-0.25*cos(th3)+0.6*sin(th3),...
0.10*cos(th3)+0.4*sin(th3),...
-0.03*cos(th3)+0.33*sin(th3),...
-0.03*cos(th3)];

x04=-5.0;
y04=-4;
phi4=0:0.01:2*pi;

xI1_1=x04+0.6*cos(phi4);
yI1_1=y04+0.9*sin(phi4);

xI1_2=x04+0.55*cos(phi4);
yI1_2=y04+0.85*sin(phi4);

xI1_3=x04+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI1_3=y04+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

x05=6.5;
y05=-1.25;
phi5=0:0.01:2*pi;

xI2_1=x05+0.6*cos(phi5);
yI2_1=y05+0.9*sin(phi5);

xI2_2=x05+0.55*cos(phi5);
yI2_2=y05+0.85*sin(phi5);

xI2_3=x05+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI2_3=y05+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

x06=-0.5;
y06=5.5;

xV3_1=x06+[-0.032,0.032,0.032,-0.032]+0.1-0.3;
yV3_1=y06+[-1.5,-1.5,1.5,1.5];

xV3_2=x06+[-0.05,0.05,0.05,-0.05]-0.2+0.3;
yV3_2=y06+[-0.75,-0.75,0.75,0.75];

xcable1=[-9.5,-9.5,x01,x01];
ycable1=y01+[0.1,-0.1,-0.1,0.1];

xcable2=x02+[-0.05,0.05,0.05,-0.05];
ycable2=[y02+1.6,y02+1.6,y06+0.1,y06+0.1];

```

```

xcable3=x02+[-0.05,0.05,0.05,-0.05];
ycable3=[y02,y02,y04+0.9,y04+0.9];

xcable4=x02+[-0.05,0.05,0.05,-0.05];
ycable4=[-7.0,-7.0,y04-0.9,y04-0.9];

xcable5=[-9.5,-9.5,x05,x05];
ycable5=-7.0+[0.1,-0.1,-0.1,0.1];

xcable6=x05+[-0.05,0.05,0.05,-0.05];
ycable6=[-7.1,-7.1,y05-0.9,y05-0.9];

xcable7=x05+[-0.05,0.05,0.05,-0.05];
ycable7=[y01+0.1,y01+0.1,y05+0.9,y05+0.9];

xcable8=[x01+1.2,x01+1.2,x05,x05];
ycable8=y01+[0.1,-0.1,-0.1,0.1];

xcable9=x03+[-0.05,0.05,0.05,-0.05];
ycable9=[-7.1,-7.1,y03,y03];

xcable10=x03+[-0.05,0.05,0.05,-0.05];
ycable10=[y06+0.1,y06+0.1,y03+1.6,y03+1.6];

xcable11=[x06-0.232,x06-0.232,x02,x02];
ycable11=y06+[0.1,-0.1,-0.1,0.1];

xcable12=[x06+0.15,x06+0.15,x03,x03];
ycable12=y06+[0.1,-0.1,-0.1,0.1];

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_11,yres_11,[1.0,1.0,1.0],...
xres_12,yres_12,[0.0,0.0,0.0],...
xres_21,yres_21,[1.0,1.0,1.0],...
xres_22,yres_22,[0.0,0.0,0.0],...
xres_31,yres_31,[1.0,1.0,1.0],...
xres_32,yres_32,[0.0,0.0,0.0],...
xI1_1,yI1_1,[0.0,0.0,0.0],...
xI1_2,yI1_2,[1.0,1.0,1.0],...
xI1_3,yI1_3,[0.0,0.0,0.0],...
xI2_1,yI2_1,[0.0,0.0,0.0],...
xI2_2,yI2_2,[1.0,1.0,1.0],...
xI2_3,yI2_3,[0.0,0.0,0.0],...
xV3_1,yV3_1,[0.0,0.0,0.0],...
xV3_2,yV3_2,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
xcable10,ycable10,[0.8,0.6,0.2],...
xcable11,ycable11,[0.8,0.6,0.2],...
xcable12,ycable12,[0.8,0.6,0.2],...
'Linestyle','None')

text(-11,11,'Να απλοποιηθεί το κύκλωμα του παρακάτω σχήματος και να βρεθεί το ισοδύναμό του κατά Thevenin από
τα άκρα a, b')
text(x01+0.5,y01-1.3,'R_1','Color',[0.9,0.2,0.0])
text(x02+0.5,y02+0.8,'R_2','Color',[0.9,0.2,0.0])
text(x03+0.5,y03+0.8,'R_3','Color',[0.9,0.2,0.0])
text(x04+1.0,y04,'I_1','Color',[0.7,0.0,0.7])
text(x05+1.0,y05,'I_2','Color',[0.7,0.0,0.7])
text(x06+0.5,y06+1.0,'V','Color',[0.0,0.2,0.9])
text(-10.0,y01,'a','Color',[0.9,0.0,0.0])
text(-10.0,-7.1,'b','Color',[0.9,0.0,0.0])

axis([-12,12,-12,12])
axis off;
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
% Choose default command line output for g_asknsn_5

```

```

        handles.output = hObject;

        % Update handles structure
        guidata(hObject, handles);

    % UIWAIT makes g_asknsn_5 wait for user response (see UIRESUME)
    % uiwait(handles.figure1);

% --- Outputs from this function are returned to the command line.
function varargout = g_asknsn_5_OutputFcn(hObject, eventdata, handles)
% varargout cell array for returning output args (see VARARGOUT);
% hObject handle to figure
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

    % Get default command line output from handles structure
    varargout{1} = handles.output;

% --- Executes on button press in pushbutton1.
function pushbutton1_Callback(hObject, eventdata, handles)
% hObject handle to pushbutton1 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
                                global snmeio;
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
                                snmeio=1;
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

        x_back=[-12,12,12,-12];
        y_back=[-12,-12,12,12];

        x_tableau=[-11,11,11,-11];
        y_tableau=[-11,-11,9,9];

        x01=-1;
        y01=2;
        th1=0;

        xres_11=x01+[0.40*sin(th1),0.40*sin(th1)+1.2*cos(th1),...
        -0.40*sin(th1)+1.2*cos(th1),-0.40*sin(th1)];
        yres_11=y01+[-0.40*cos(th1),-0.40*cos(th1)+1.2*sin(th1),...
        0.40*cos(th1)+1.2*sin(th1),0.40*cos(th1)];

        xres_12=x01+[-0.05*sin(th1),-0.05*sin(th1)+0.25*cos(th1),...
        -0.40*sin(th1)+0.3*cos(th1),...
        0.25*sin(th1)+0.45*cos(th1),...
        -0.40*sin(th1)+0.6*cos(th1),...
        0.25*sin(th1)+0.75*cos(th1),...
        -0.40*sin(th1)+0.9*cos(th1),...
        -0.05*sin(th1)+0.95*cos(th1),...
        -0.05*sin(th1)+1.2*cos(th1),...
        0.05*sin(th1)+1.2*cos(th1),...
        0.05*sin(th1)+0.95*cos(th1),...
        -0.25*sin(th1)+0.9*cos(th1),...
        0.40*sin(th1)+0.75*cos(th1),...
        -0.25*sin(th1)+0.6*cos(th1),...
        0.40*sin(th1)+0.45*cos(th1),...
        -0.25*sin(th1)+0.3*cos(th1),...
        0.05*sin(th1)+0.25*cos(th1),...
        0.05*sin(th1)];
        yres_12=y01+[0.05*cos(th1),0.05*cos(th1)+0.25*sin(th1),...
        0.40*cos(th1)+0.3*sin(th1),...
        -0.25*cos(th1)+0.45*sin(th1),...
        0.40*cos(th1)+0.6*sin(th1),...
        -0.250*cos(th1)+0.75*sin(th1),...
        0.40*cos(th1)+0.9*sin(th1),...
        0.05*cos(th1)+0.95*sin(th1),...
        0.05*cos(th1)+1.2*sin(th1),...
        -0.05*cos(th1)+1.2*sin(th1),...
        -0.05*cos(th1)+0.95*sin(th1),...
        0.25*cos(th1)+0.9*sin(th1),...
        -0.40*cos(th1)+0.75*sin(th1),...
        0.25*cos(th1)+0.6*sin(th1),...
        -0.40*cos(th1)+0.45*sin(th1),...
        0.25*cos(th1)+0.3*sin(th1),...
        -0.05*cos(th1)+0.25*sin(th1),...

```

```

-0.05*cos(th1)];
x02=-5;
y02=-1;
th2=pi/2;

xres_21=x02+[0.25*sin(th2),0.25*sin(th2)+1.6*cos(th2),...
-0.25*sin(th2)+1.6*cos(th2),-0.25*sin(th2)];
yres_21=y02+[-0.25*cos(th2),-0.25*cos(th2)+1.6*sin(th2),...
0.25*cos(th2)+1.6*sin(th2),0.25*cos(th2)];

xres_22=x02+[-0.03*sin(th2),-0.03*sin(th2)+0.33*cos(th2),...
-0.25*sin(th2)+0.4*cos(th2),...
0.10*sin(th2)+0.6*cos(th2),...
-0.25*sin(th2)+0.8*cos(th2),...
0.10*sin(th2)+1.0*cos(th2),...
-0.25*sin(th2)+1.2*cos(th2),...
-0.03*sin(th2)+1.27*cos(th2),...
-0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.27*cos(th2),...
-0.10*sin(th2)+1.2*cos(th2),...
0.25*sin(th2)+1.0*cos(th2),...
-0.10*sin(th2)+0.8*cos(th2),...
0.25*sin(th2)+0.6*cos(th2),...
-0.10*sin(th2)+0.4*cos(th2),...
0.03*sin(th2)+0.33*cos(th2),...
0.03*sin(th2)];
yres_22=y02+[0.03*cos(th2),0.03*cos(th2)+0.33*sin(th2),...
0.25*cos(th2)+0.4*sin(th2),...
-0.10*cos(th2)+0.6*sin(th2),...
0.25*cos(th2)+0.8*sin(th2),...
-0.10*cos(th2)+1.0*sin(th2),...
0.25*cos(th2)+1.2*sin(th2),...
0.03*cos(th2)+1.27*sin(th2),...
0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.27*sin(th2),...
0.10*cos(th2)+1.2*sin(th2),...
-0.25*cos(th2)+1.0*sin(th2),...
0.10*cos(th2)+0.8*sin(th2),...
-0.25*cos(th2)+0.6*sin(th2),...
0.10*cos(th2)+0.4*sin(th2),...
-0.03*cos(th2)+0.33*sin(th2),...
-0.03*cos(th2)];

x03=3.5;
y03=-2;
th3=pi/2;

xres_31=x03+[0.25*sin(th3),0.25*sin(th3)+1.6*cos(th3),...
-0.25*sin(th3)+1.6*cos(th3),-0.25*sin(th3)];
yres_31=y03+[-0.25*cos(th3),-0.25*cos(th3)+1.6*sin(th3),...
0.25*cos(th3)+1.6*sin(th3),0.25*cos(th3)];

xres_32=x03+[-0.03*sin(th3),-0.03*sin(th3)+0.33*cos(th3),...
-0.25*sin(th3)+0.4*cos(th3),...
0.10*sin(th3)+0.6*cos(th3),...
-0.25*sin(th3)+0.8*cos(th3),...
0.10*sin(th3)+1.0*cos(th3),...
-0.25*sin(th3)+1.2*cos(th3),...
-0.03*sin(th3)+1.27*cos(th3),...
-0.03*sin(th3)+1.6*cos(th3),...
0.03*sin(th3)+1.6*cos(th3),...
0.03*sin(th3)+1.27*cos(th3),...
-0.10*sin(th3)+1.2*cos(th3),...
0.25*sin(th3)+1.0*cos(th3),...
-0.10*sin(th3)+0.8*cos(th3),...
0.25*sin(th3)+0.6*cos(th3),...
-0.10*sin(th3)+0.4*cos(th3),...
0.03*sin(th3)+0.33*cos(th3),...
0.03*sin(th3)];
yres_32=y03+[0.03*cos(th3),0.03*cos(th3)+0.33*sin(th3),...
0.25*cos(th3)+0.4*sin(th3),...
-0.10*cos(th3)+0.6*sin(th3),...
0.25*cos(th3)+0.8*sin(th3),...
-0.10*cos(th3)+1.0*sin(th3),...
0.25*cos(th3)+1.2*sin(th3),...
0.03*cos(th3)+1.27*sin(th3),...
0.03*cos(th3)+1.6*sin(th3),...
-0.03*cos(th3)+1.6*sin(th3),...
-0.03*cos(th3)+1.27*sin(th3),...

```



```

0.10*cos(th3)+1.2*sin(th3),...
-0.25*cos(th3)+1.0*sin(th3),...
0.10*cos(th3)+0.8*sin(th3),...
-0.25*cos(th3)+0.6*sin(th3),...
0.10*cos(th3)+0.4*sin(th3),...
-0.03*cos(th3)+0.33*sin(th3),...
-0.03*cos(th3)];

x04=-5.0;
y04=-4;
phi4=0:0.01:2*pi;

xI1_1=x04+0.6*cos(phi4);
yI1_1=y04+0.9*sin(phi4);

xI1_2=x04+0.55*cos(phi4);
yI1_2=y04+0.85*sin(phi4);

xI1_3=x04+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI1_3=y04+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

x05=6.5;
y05=-1.25;
phi5=0:0.01:2*pi;

xI2_1=x05+0.6*cos(phi5);
yI2_1=y05+0.9*sin(phi5);

xI2_2=x05+0.55*cos(phi5);
yI2_2=y05+0.85*sin(phi5);

xI2_3=x05+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI2_3=y05+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

x06=-0.5;
y06=5.5;

xV3_1=x06+[-0.032,0.032,0.032,-0.032]+0.1-0.3;
yV3_1=y06+[-1.5,-1.5,1.5,1.5];

xV3_2=x06+[-0.05,0.05,0.05,-0.05]-0.2+0.3;
yV3_2=y06+[-0.75,-0.75,0.75,0.75];

xcable1=[-9.5,-9.5,x01,x01];
ycable1=y01+[0.1,-0.1,-0.1,0.1];

xcable2=x02+[-0.05,0.05,0.05,-0.05];
ycable2=[y02+1.6,y02+1.6,y06+0.1,y06+0.1];

xcable3=x02+[-0.05,0.05,0.05,-0.05];
ycable3=[y02,y02,y04+0.9,y04+0.9];

xcable4=x02+[-0.05,0.05,0.05,-0.05];
ycable4=[-7.0,-7.0,y04-0.9,y04-0.9];

xcable5=[-9.5,-9.5,x05,x05];
ycable5=-7.0+[0.1,-0.1,-0.1,0.1];

xcable6=x05+[-0.05,0.05,0.05,-0.05];
ycable6=[-7.1,-7.1,y05-0.9,y05-0.9];

xcable7=x05+[-0.05,0.05,0.05,-0.05];
ycable7=[y01+0.1,y01+0.1,y05+0.9,y05+0.9];

xcable8=[x01+1.2,x01+1.2,x05,x05];
ycable8=y01+[0.1,-0.1,-0.1,0.1];

xcable9=x03+[-0.05,0.05,0.05,-0.05];
ycable9=[-7.1,-7.1,y03,y03];

xcable10=x03+[-0.05,0.05,0.05,-0.05];
ycable10=[y06+0.1,y06+0.1,y03+1.6,y03+1.6];

xcable11=[x06-0.232,x06-0.232,x02,x02];
ycable11=y06+[0.1,-0.1,-0.1,0.1];

xcable12=[x06+0.15,x06+0.15,x03,x03];
ycable12=y06+[0.1,-0.1,-0.1,0.1];

```

```

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_11,yres_11,[1.0,1.0,1.0],...
xres_12,yres_12,[0.0,0.0,0.0],...
xres_21,yres_21,[1.0,1.0,1.0],...
xres_22,yres_22,[0.0,0.0,0.0],...
xres_31,yres_31,[1.0,1.0,1.0],...
xres_32,yres_32,[0.0,0.0,0.0],...
xi1_1,yi1_1,[0.0,0.0,0.0],...
xi1_2,yi1_2,[1.0,1.0,1.0],...
xi1_3,yi1_3,[0.0,0.0,0.0],...
xi2_1,yi2_1,[0.0,0.0,0.0],...
xi2_2,yi2_2,[1.0,1.0,1.0],...
xi2_3,yi2_3,[0.0,0.0,0.0],...
xv3_1,yv3_1,[0.0,0.0,0.0],...
xv3_2,yv3_2,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
xcable10,ycable10,[0.8,0.6,0.2],...
xcable11,ycable11,[0.8,0.6,0.2],...
xcable12,ycable12,[0.8,0.6,0.2],...
    'LineStyle','None')

text(-11,11,'Η αντίσταση R_{1} είναι παράλληλα συνδεδεμένη με πηγή τάσης και άρα απαλείφεται. Επίσης η
αντίσταση R_{2} είναι ')
text(-11,10,'σε σειρά με πηγή ρεύματος οπότε παραλείπεται επίσης. Αντικαθιστούμε τις R_{3}, I_{2} με το
ισοδύναμό τους κατά Thevenin. Έχουμε')

text(x01+0.5,y01-1.3,'R_1','Color',[0.9,0.2,0.0])
text(x02+0.5,y02+0.8,'R_2','Color',[0.9,0.2,0.0])
text(x03+0.5,y03+0.8,'R_3','Color',[0.9,0.2,0.0])
text(x04+1.0,y04,'I_1','Color',[0.7,0.0,0.7])
text(x05+1.0,y05,'I_2','Color',[0.7,0.0,0.7])
text(x06+0.5,y06+1.0,'V','Color',[0.0,0.2,0.9])
text(-10.0,y01,'a','Color',[0.9,0.0,0.0])
text(-10.0,-7.1,'b','Color',[0.9,0.0,0.0])

axis([-12,12,-12,12])
axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

% --- Executes on button press in pushbutton2.
function pushbutton2_Callback(hObject, eventdata, handles)
% hObject handle to pushbutton2 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
global snmeio;

snmeio=snmeio+1;

if (snmeio==5)
snmeio=1;
end

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
if (snmeio==1)
axes(handles.axes1);
cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,9,9];

```

```

x01=-1;
y01=2;
th1=0;

xres_11=x01+[0.40*sin(th1),0.40*sin(th1)+1.2*cos(th1),...
-0.40*sin(th1)+1.2*cos(th1),-0.40*sin(th1)];
yres_11=y01+[-0.40*cos(th1),-0.40*cos(th1)+1.2*sin(th1),...
0.40*cos(th1)+1.2*sin(th1),0.40*cos(th1)];

xres_12=x01+[-0.05*sin(th1),-0.05*sin(th1)+0.25*cos(th1),...
-0.40*sin(th1)+0.3*cos(th1),...
0.25*sin(th1)+0.45*cos(th1),...
-0.40*sin(th1)+0.6*cos(th1),...
0.25*sin(th1)+0.75*cos(th1),...
-0.40*sin(th1)+0.9*cos(th1),...
-0.05*sin(th1)+0.95*cos(th1),...
-0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+0.95*cos(th1),...
-0.25*sin(th1)+0.9*cos(th1),...
0.40*sin(th1)+0.75*cos(th1),...
-0.25*sin(th1)+0.6*cos(th1),...
0.40*sin(th1)+0.45*cos(th1),...
-0.25*sin(th1)+0.3*cos(th1),...
0.05*sin(th1)+0.25*cos(th1),...
0.05*sin(th1)];
yres_12=y01+[0.05*cos(th1),0.05*cos(th1)+0.25*sin(th1),...
0.40*cos(th1)+0.3*sin(th1),...
-0.25*cos(th1)+0.45*sin(th1),...
0.40*cos(th1)+0.6*sin(th1),...
-0.25*cos(th1)+0.75*sin(th1),...
0.40*cos(th1)+0.9*sin(th1),...
0.05*cos(th1)+0.95*sin(th1),...
0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+0.95*sin(th1),...
0.25*cos(th1)+0.9*sin(th1),...
-0.40*cos(th1)+0.75*sin(th1),...
0.25*cos(th1)+0.6*sin(th1),...
-0.40*cos(th1)+0.45*sin(th1),...
0.25*cos(th1)+0.3*sin(th1),...
-0.05*cos(th1)+0.25*sin(th1),...
-0.05*cos(th1)];
x02=-5;
y02=-1;
th2=pi/2;

xres_21=x02+[0.25*sin(th2),0.25*sin(th2)+1.6*cos(th2),...
-0.25*sin(th2)+1.6*cos(th2),-0.25*sin(th2)];
yres_21=y02+[-0.25*cos(th2),-0.25*cos(th2)+1.6*sin(th2),...
0.25*cos(th2)+1.6*sin(th2),0.25*cos(th2)];

xres_22=x02+[-0.03*sin(th2),-0.03*sin(th2)+0.33*cos(th2),...
-0.25*sin(th2)+0.4*cos(th2),...
0.10*sin(th2)+0.6*cos(th2),...
-0.25*sin(th2)+0.8*cos(th2),...
0.10*sin(th2)+1.0*cos(th2),...
-0.25*sin(th2)+1.2*cos(th2),...
-0.03*sin(th2)+1.27*cos(th2),...
-0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.27*cos(th2),...
-0.10*sin(th2)+1.2*cos(th2),...
0.25*sin(th2)+1.0*cos(th2),...
-0.10*sin(th2)+0.8*cos(th2),...
0.25*sin(th2)+0.6*cos(th2),...
-0.10*sin(th2)+0.4*cos(th2),...
0.03*sin(th2)+0.33*cos(th2),...
0.03*sin(th2)];
yres_22=y02+[0.03*cos(th2),0.03*cos(th2)+0.33*sin(th2),...
0.25*cos(th2)+0.4*sin(th2),...
-0.10*cos(th2)+0.6*sin(th2),...
0.25*cos(th2)+0.8*sin(th2),...
-0.10*cos(th2)+1.0*sin(th2),...
0.25*cos(th2)+1.2*sin(th2),...
0.03*cos(th2)+1.27*sin(th2),...
0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.27*sin(th2),...
0.10*cos(th2)+1.2*sin(th2),...
-0.25*cos(th2)+1.0*sin(th2),...

```

```

0.10*cos(th2)+0.8*sin(th2),...
-0.25*cos(th2)+0.6*sin(th2),...
0.10*cos(th2)+0.4*sin(th2),...
-0.03*cos(th2)+0.33*sin(th2),...
-0.03*cos(th2)];

x03=3.5;
y03=-2;
th3=pi/2;

xres_31=x03+[0.25*sin(th3),0.25*sin(th3)+1.6*cos(th3),...
-0.25*sin(th3)+1.6*cos(th3),-0.25*sin(th3)];
yres_31=y03+[-0.25*cos(th3),-0.25*cos(th3)+1.6*sin(th3),...
0.25*cos(th3)+1.6*sin(th3),0.25*cos(th3)];

xres_32=x03+[-0.03*sin(th3),-0.03*sin(th3)+0.33*cos(th3),...
-0.25*sin(th3)+0.4*cos(th3),...
0.10*sin(th3)+0.6*cos(th3),...
-0.25*sin(th3)+0.8*cos(th3),...
0.10*sin(th3)+1.0*cos(th3),...
-0.25*sin(th3)+1.2*cos(th3),...
-0.03*sin(th3)+1.27*cos(th3),...
-0.03*sin(th3)+1.6*cos(th3),...
0.03*sin(th3)+1.6*cos(th3),...
0.03*sin(th3)+1.27*cos(th3),...
-0.10*sin(th3)+1.2*cos(th3),...
0.25*sin(th3)+1.0*cos(th3),...
-0.10*sin(th3)+0.8*cos(th3),...
0.25*sin(th3)+0.6*cos(th3),...
-0.10*sin(th3)+0.4*cos(th3),...
0.03*sin(th3)+0.33*cos(th3),...
0.03*sin(th3)];
yres_32=y03+[0.03*cos(th3),0.03*cos(th3)+0.33*sin(th3),...
0.25*cos(th3)+0.4*sin(th3),...
-0.10*cos(th3)+0.6*sin(th3),...
0.25*cos(th3)+0.8*sin(th3),...
-0.10*cos(th3)+1.0*sin(th3),...
0.25*cos(th3)+1.2*sin(th3),...
0.03*cos(th3)+1.27*sin(th3),...
0.03*cos(th3)+1.6*sin(th3),...
-0.03*cos(th3)+1.6*sin(th3),...
-0.03*cos(th3)+1.27*sin(th3),...
0.10*cos(th3)+1.2*sin(th3),...
-0.25*cos(th3)+1.0*sin(th3),...
0.10*cos(th3)+0.8*sin(th3),...
-0.25*cos(th3)+0.6*sin(th3),...
0.10*cos(th3)+0.4*sin(th3),...
-0.03*cos(th3)+0.33*sin(th3),...
-0.03*cos(th3)];

x04=-5.0;
y04=-4;
phi4=0:0.01:2*pi;

xI1_1=x04+0.6*cos(phi4);
yI1_1=y04+0.9*sin(phi4);

xI1_2=x04+0.55*cos(phi4);
yI1_2=y04+0.85*sin(phi4);

xI1_3=x04+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI1_3=y04+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

x05=6.5;
y05=-1.25;
phi5=0:0.01:2*pi;

xI2_1=x05+0.6*cos(phi5);
yI2_1=y05+0.9*sin(phi5);

xI2_2=x05+0.55*cos(phi5);
yI2_2=y05+0.85*sin(phi5);

xI2_3=x05+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI2_3=y05+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

x06=-0.5;
y06=5.5;

```

```

xV3_1=x06+[-0.032,0.032,0.032,-0.032]+0.1-0.3;
yV3_1=y06+[-1.5,-1.5,1.5,1.5];

xV3_2=x06+[-0.05,0.05,0.05,-0.05]-0.2+0.3;
yV3_2=y06+[-0.75,-0.75,0.75,0.75];

xcable1=[-9.5,-9.5,x01,x01];
ycable1=y01+[0.1,-0.1,-0.1,0.1];

xcable2=x02+[-0.05,0.05,0.05,-0.05];
ycable2=[y02+1.6,y02+1.6,y06+0.1,y06+0.1];

xcable3=x02+[-0.05,0.05,0.05,-0.05];
ycable3=[y02,y02,y04+0.9,y04+0.9];

xcable4=x02+[-0.05,0.05,0.05,-0.05];
ycable4=[-7.0,-7.0,y04-0.9,y04-0.9];

xcable5=[-9.5,-9.5,x05,x05];
ycable5=-7.0+[0.1,-0.1,-0.1,0.1];

xcable6=x05+[-0.05,0.05,0.05,-0.05];
ycable6=[-7.1,-7.1,y05-0.9,y05-0.9];

xcable7=x05+[-0.05,0.05,0.05,-0.05];
ycable7=[y01+0.1,y01+0.1,y05+0.9,y05+0.9];

xcable8=[x01+1.2,x01+1.2,x05,x05];
ycable8=y01+[0.1,-0.1,-0.1,0.1];

xcable9=x03+[-0.05,0.05,0.05,-0.05];
ycable9=[-7.1,-7.1,y03,y03];

xcable10=x03+[-0.05,0.05,0.05,-0.05];
ycable10=[y06+0.1,y06+0.1,y03+1.6,y03+1.6];

xcable11=[x06-0.232,x06-0.232,x02,x02];
ycable11=y06+[0.1,-0.1,-0.1,0.1];

xcable12=[x06+0.15,x06+0.15,x03,x03];
ycable12=y06+[0.1,-0.1,-0.1,0.1];

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_11,yres_11,[1.0,1.0,1.0],...
xres_12,yres_12,[0.0,0.0,0.0],...
xres_21,yres_21,[1.0,1.0,1.0],...
xres_22,yres_22,[0.0,0.0,0.0],...
xres_31,yres_31,[1.0,1.0,1.0],...
xres_32,yres_32,[0.0,0.0,0.0],...
xI1_1,yI1_1,[0.0,0.0,0.0],...
xI1_2,yI1_2,[1.0,1.0,1.0],...
xI1_3,yI1_3,[0.0,0.0,0.0],...
xI2_1,yI2_1,[0.0,0.0,0.0],...
xI2_2,yI2_2,[1.0,1.0,1.0],...
xI2_3,yI2_3,[0.0,0.0,0.0],...
xV3_1,yV3_1,[0.0,0.0,0.0],...
xV3_2,yV3_2,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
xcable10,ycable10,[0.8,0.6,0.2],...
xcable11,ycable11,[0.8,0.6,0.2],...
xcable12,ycable12,[0.8,0.6,0.2],...
'Linestyle','None')

text(-11,11,'H αντίσταση R_{1} είναι παράλληλα συνδεδεμένη με πηγή τάσης και άρα απαλείφεται. Επίσης η
αντίσταση R_{2} είναι ')
text(-11,10,'σε σειρά με πηγή ρεύματος οπότε παραλείπεται επίσης. Αντικαθιστούμε τις R_{3}, I_{2} με το
ισοδύναμό τους κατά Thevenin. Έχουμε')

text(x01+0.5,y01-1.3,'R_1','Color',[0.9,0.2,0.0])

```

```

text(x02+0.5,y02+0.8,'R_2','Color',[0.9,0.2,0.0])
text(x03+0.5,y03+0.8,'R_3','Color',[0.9,0.2,0.0])
text(x04+1.0,y04,'I_1','Color',[0.7,0.0,0.7])
text(x05+1.0,y05,'I_2','Color',[0.7,0.0,0.7])
text(x06+0.5,y06+1.0,'V','Color',[0.0,0.2,0.9])
text(-10.0,y01,'a','Color',[0.9,0.0,0.0])
text(-10.0,-7.1,'b','Color',[0.9,0.0,0.0])

axis([-12,12,-12,12])
axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
elseif (snmeio==2)
axes(handles.axes1);
cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,9,9];

x01=1;
y01=2;
th1=0;

xres_11=x01+[0.40*sin(th1),0.40*sin(th1)+1.2*cos(th1),...
-0.40*sin(th1)+1.2*cos(th1),-0.40*sin(th1)];
yres_11=y01+[-0.40*cos(th1),-0.40*cos(th1)+1.2*sin(th1),...
0.40*cos(th1)+1.2*sin(th1),0.40*cos(th1)];

xres_12=x01+[-0.05*sin(th1),-0.05*sin(th1)+0.25*cos(th1),...
-0.40*sin(th1)+0.3*cos(th1),...
0.25*sin(th1)+0.45*cos(th1),...
-0.40*sin(th1)+0.6*cos(th1),...
0.25*sin(th1)+0.75*cos(th1),...
-0.40*sin(th1)+0.9*cos(th1),...
-0.05*sin(th1)+0.95*cos(th1),...
-0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+0.95*cos(th1),...
-0.25*sin(th1)+0.9*cos(th1),...
0.40*sin(th1)+0.75*cos(th1),...
-0.25*sin(th1)+0.6*cos(th1),...
0.40*sin(th1)+0.45*cos(th1),...
-0.25*sin(th1)+0.3*cos(th1),...
0.05*sin(th1)+0.25*cos(th1),...
0.05*sin(th1)];
yres_12=y01+[0.05*cos(th1),0.05*cos(th1)+0.25*sin(th1),...
0.40*cos(th1)+0.3*sin(th1),...
-0.25*cos(th1)+0.45*sin(th1),...
0.40*cos(th1)+0.6*sin(th1),...
-0.250*cos(th1)+0.75*sin(th1),...
0.40*cos(th1)+0.9*sin(th1),...
0.05*cos(th1)+0.95*sin(th1),...
0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+0.95*sin(th1),...
0.25*cos(th1)+0.9*sin(th1),...
-0.40*cos(th1)+0.75*sin(th1),...
0.25*cos(th1)+0.6*sin(th1),...
-0.40*cos(th1)+0.45*sin(th1),...
0.25*cos(th1)+0.3*sin(th1),...
-0.05*cos(th1)+0.25*sin(th1),...
-0.05*cos(th1)];

x04=-5.0;
y04=-2;
phi4=0:0.01:2*pi;

xI1_1=x04+0.6*cos(phi4);
yI1_1=y04+0.9*sin(phi4);

xI1_2=x04+0.55*cos(phi4);
yI1_2=y04+0.85*sin(phi4);

xI1_3=x04+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI1_3=y04+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

```

```

x06=-1.5;
y06=y01;

xV3_1=x06+[-0.032,0.032,0.032,-0.032]+0.1-0.3;
yV3_1=y06+[-1.5,-1.5,1.5,1.5];

xV3_2=x06+[-0.05,0.05,0.05,-0.05]-0.2+0.3;
yV3_2=y06+[-0.75,-0.75,0.75,0.75];

x07=6.5;
y07=-2.0;

xv1_1=x07+[-1.0,1.0,1.0,-1.0];
yV1_1=y07+[-0.05,-0.05,0.05,0.05]+0.3;

xv1_2=x07+[-0.4,0.4,0.4,-0.4];
yV1_2=y07+[-0.1,-0.1,0.1,0.1]-0.1;

xcable1=[-9.5,-9.5,x06-0.232,x06-0.232];
ycable1=y01+[0.1,-0.1,-0.1,0.1];

xcable2=[x01,x01,x06+0.15,x06+0.15];
ycable2=y01+[0.1,-0.1,-0.1,0.1];

xcable3=[x01+1.2,x01+1.2,x07,x07];
ycable3=y01+[0.1,-0.1,-0.1,0.1];

xcable4=x07+[-0.05,0.05,0.05,-0.05];
ycable4=[y01+0.1,y01+0.1,y07+0.35,y07+0.35];

xcable5=x07+[-0.05,0.05,0.05,-0.05];
ycable5=[-7.0,-7.0,y07-0.2,y07-0.2];

xcable6=[-9.5,-9.5,x07,x07];
ycable6=-7.0+[0.1,-0.1,-0.1,0.1];

xcable7=x04+[-0.05,0.05,0.05,-0.05];
ycable7=[y01+0.1,y01+0.1,y04+0.9,y04+0.9];

xcable8=x04+[-0.05,0.05,0.05,-0.05];
ycable8=[-7.0,-7.0,y04-0.9,y04-0.9];

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_11,yres_11,[1.0,1.0,1.0],...
xres_12,yres_12,[0.0,0.0,0.0],...
xi1_1,yi1_1,[0.0,0.0,0.0],...
xi1_2,yi1_2,[1.0,1.0,1.0],...
xi1_3,yi1_3,[0.0,0.0,0.0],...
xV3_1,yV3_1,[0.0,0.0,0.0],...
xV3_2,yV3_2,[0.0,0.0,0.0],...
xV1_1,yV1_1,[0.0,0.0,0.0],...
xV1_2,yV1_2,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
'Linestyle','None')

text(-11,11,'Προσθέτουμε τις πηγές τάσης V και R_{3}I_{2} και σχηματίζουμε το κατά Norton ισοδύναμο του
κυκλώματος. Θα έχουμε')

text(x01+0.3,y01+1.2,'R_3','Color',[0.9,0.2,0.0])
text(x06+0.5,y06+1.0,'V','Color',[0.0,0.2,0.9])
text(x04+1.0,y04,'I_1','Color',[0.7,0.0,0.7])
text(x07+1.3,y07,'R_{3}I_{2}','Color',[0.0,0.2,0.9])
text(-10.0,y01,'a','Color',[0.9,0.0,0.0])
text(-10.0,-7.1,'b','Color',[0.9,0.0,0.0])

```

```

axis([-12,12,-12,12])
axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
elseif (snmeio==3)
axes(handles.axes1);
cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,9,9];

x01=1;
y01=2;
th1=0;

x03=6.5;
y03=-3;
th3=pi/2;

xres_31=x03+[0.25*sin(th3),0.25*sin(th3)+1.6*cos(th3),...
-0.25*sin(th3)+1.6*cos(th3),-0.25*sin(th3)];
yres_31=y03+[-0.25*cos(th3),-0.25*cos(th3)+1.6*sin(th3),...
0.25*cos(th3)+1.6*sin(th3),0.25*cos(th3)];

xres_32=x03+[-0.03*sin(th3),-0.03*sin(th3)+0.33*cos(th3),...
-0.25*sin(th3)+0.4*cos(th3),...
0.10*sin(th3)+0.6*cos(th3),...
-0.25*sin(th3)+0.8*cos(th3),...
0.10*sin(th3)+1.0*cos(th3),...
-0.25*sin(th3)+1.2*cos(th3),...
-0.03*sin(th3)+1.27*cos(th3),...
-0.03*sin(th3)+1.6*cos(th3),...
0.03*sin(th3)+1.6*cos(th3),...
0.03*sin(th3)+1.27*cos(th3),...
-0.10*sin(th3)+1.2*cos(th3),...
0.25*sin(th3)+1.0*cos(th3),...
-0.10*sin(th3)+0.8*cos(th3),...
0.25*sin(th3)+0.6*cos(th3),...
-0.10*sin(th3)+0.4*cos(th3),...
0.03*sin(th3)+0.33*cos(th3),...
0.03*sin(th3)];
yres_32=y03+[0.03*cos(th3),0.03*cos(th3)+0.33*sin(th3),...
0.25*cos(th3)+0.4*sin(th3),...
-0.10*cos(th3)+0.6*sin(th3),...
0.25*cos(th3)+0.8*sin(th3),...
-0.10*cos(th3)+1.0*sin(th3),...
0.25*cos(th3)+1.2*sin(th3),...
0.03*cos(th3)+1.27*sin(th3),...
0.03*cos(th3)+1.6*sin(th3),...
-0.03*cos(th3)+1.6*sin(th3),...
-0.03*cos(th3)+1.27*sin(th3),...
0.10*cos(th3)+1.2*sin(th3),...
-0.25*cos(th3)+1.0*sin(th3),...
0.10*cos(th3)+0.8*sin(th3),...
-0.25*cos(th3)+0.6*sin(th3),...
0.10*cos(th3)+0.4*sin(th3),...
-0.03*cos(th3)+0.33*sin(th3),...
-0.03*cos(th3)];

x04=-5.0;
y04=-2;
phi4=0:0.01:2*pi;

xI1_1=x04+0.6*cos(phi4);
yI1_1=y04+0.9*sin(phi4);

xI1_2=x04+0.55*cos(phi4);
yI1_2=y04+0.85*sin(phi4);

xI1_3=x04+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI1_3=y04+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

x06=-1.5;
y06=y01;

```



```

x07=6.5;
y07=-2.0;

x08=0.0;
y08=-2;
phi8=0:0.01:2*pi;

xI2_1=x08+0.6*cos(phi8);
yI2_1=y08+0.9*sin(phi8);

xI2_2=x08+0.55*cos(phi8);
yI2_2=y08+0.85*sin(phi8);

xI2_3=x08+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI2_3=y08+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

```

```

xcable1=[-9.5,-9.5,x06+0.15,x06+0.15];
ycable1=y01+[0.1,-0.1,-0.1,0.1];

xcable2=[x01,x01,x06+0.15,x06+0.15];
ycable2=y01+[0.1,-0.1,-0.1,0.1];

xcable3=[x01,x01,x07,x07];
ycable3=y01+[0.1,-0.1,-0.1,0.1];

xcable4=x07+[-0.05,0.05,0.05,-0.05];
ycable4=[y01+0.1,y01+0.1,y07+0.35,y07+0.35];

xcable5=x07+[-0.05,0.05,0.05,-0.05];
ycable5=[-7.0,-7.0,y03,y03];

xcable5_1=x07+[-0.05,0.05,0.05,-0.05];
ycable5_1=[y01,y01,y03+1.6,y03+1.6];

xcable6=[-9.5,-9.5,x07,x07];
ycable6=-7.0+[0.1,-0.1,-0.1,0.1];

xcable7=x04+[-0.05,0.05,0.05,-0.05];
ycable7=[y01+0.1,y01+0.1,y04+0.9,y04+0.9];

xcable8=x04+[-0.05,0.05,0.05,-0.05];
ycable8=[-7.0,-7.0,y04-0.9,y04-0.9];

xcable9=x08+[-0.05,0.05,0.05,-0.05];
ycable9=[y01+0.1,y01+0.1,y04+0.9,y04+0.9];

xcable10=x08+[-0.05,0.05,0.05,-0.05];
ycable10=[-7.0,-7.0,y04-0.9,y04-0.9];

```

```

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_31,yres_31,[1.0,1.0,1.0],...
xres_32,yres_32,[0.0,0.0,0.0],...
xI1_1,yI1_1,[0.0,0.0,0.0],...
xI1_2,yI1_2,[1.0,1.0,1.0],...
xI1_3,yI1_3,[0.0,0.0,0.0],...
xI2_1,yI2_1,[0.0,0.0,0.0],...
xI2_2,yI2_2,[1.0,1.0,1.0],...
xI2_3,yI2_3,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable5_1,ycable5_1,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
xcable10,ycable10,[0.8,0.6,0.2],...
'LineStyle','None')

```

text(-11,11,'Προσθέτουμε τις δύο πηγές ρεύματος και μετασχηματίζουμε στο κατά Thevenin ισοδύναμό του, οπότε έχουμε')

```

text(x04+1.0,y04,'I_1','Color',[0.7,0.0,0.7])
text(x07+1.3,y07,'R_{3}','Color',[0.9,0.2,0.0])
text(-10.0,y01,'a','Color',[0.9,0.0,0.0])
text(-10.0,-7.1,'b','Color',[0.9,0.0,0.0])
text(x08+1.0,y08,'I_{2}+(V/R_{3})','Color',[0.7,0.0,0.7])

axis([-12,12,-12,12])
axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
elseif (snmeio==4)
axes(handles.axes1);
cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,9,9];

x01=1;
y01=2;
th1=0;

xres_11=x01+[0.40*sin(th1),0.40*sin(th1)+1.2*cos(th1),...
-0.40*sin(th1)+1.2*cos(th1),-0.40*sin(th1)];
yres_11=y01+[-0.40*cos(th1),-0.40*cos(th1)+1.2*sin(th1),...
0.40*cos(th1)+1.2*sin(th1),0.40*cos(th1)];

xres_12=x01+[-0.05*sin(th1),-0.05*sin(th1)+0.25*cos(th1),...
-0.40*sin(th1)+0.3*cos(th1),...
0.25*sin(th1)+0.45*cos(th1),...
-0.40*sin(th1)+0.6*cos(th1),...
0.25*sin(th1)+0.75*cos(th1),...
-0.40*sin(th1)+0.9*cos(th1),...
-0.05*sin(th1)+0.95*cos(th1),...
-0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+0.95*cos(th1),...
-0.25*sin(th1)+0.9*cos(th1),...
0.40*sin(th1)+0.75*cos(th1),...
-0.25*sin(th1)+0.6*cos(th1),...
0.40*sin(th1)+0.45*cos(th1),...
-0.25*sin(th1)+0.3*cos(th1),...
0.05*sin(th1)+0.25*cos(th1),...
0.05*sin(th1)];
yres_12=y01+[0.05*cos(th1),0.05*cos(th1)+0.25*sin(th1),...
0.40*cos(th1)+0.3*sin(th1),...
-0.25*cos(th1)+0.45*sin(th1),...
0.40*cos(th1)+0.6*sin(th1),...
-0.250*cos(th1)+0.75*sin(th1),...
0.40*cos(th1)+0.9*sin(th1),...
0.05*cos(th1)+0.95*sin(th1),...
0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+0.95*sin(th1),...
0.25*cos(th1)+0.9*sin(th1),...
-0.40*cos(th1)+0.75*sin(th1),...
0.25*cos(th1)+0.6*sin(th1),...
-0.40*cos(th1)+0.45*sin(th1),...
0.25*cos(th1)+0.3*sin(th1),...
-0.05*cos(th1)+0.25*sin(th1),...
-0.05*cos(th1)];

x04=-5.0;
y04=-2;
phi4=0:0.01:2*pi;

x06=-1.5;
y06=y01;

x07=6.5;
y07=-2.0;

xV1_1=x07+[-1.0,1.0,1.0,-1.0];
yV1_1=y07+[-0.05,-0.05,0.05,0.05]+0.3;

xV1_2=x07+[-0.4,0.4,0.4,-0.4];

```

```

yV1_2=y07+[-0.1,-0.1,0.1,0.1]-0.1;

xcable1=[-9.5,-9.5,x06+0.15,x06+0.15];
ycable1=y01+[0.1,-0.1,-0.1,0.1];

xcable2=[x01,x01,x06+0.15,x06+0.15];
ycable2=y01+[0.1,-0.1,-0.1,0.1];

xcable3=[x01+1.2,x01+1.2,x07,x07];
ycable3=y01+[0.1,-0.1,-0.1,0.1];

xcable4=x07+[-0.05,0.05,0.05,-0.05];
ycable4=[y01+0.1,y01+0.1,y07+0.35,y07+0.35];

xcable5=x07+[-0.05,0.05,0.05,-0.05];
ycable5=[-7.0,-7.0,y07-0.2,y07-0.2];

xcable6=[-9.5,-9.5,x07,x07];
ycable6=-7.0+[0.1,-0.1,-0.1,0.1];

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_11,yres_11,[1.0,1.0,1.0],...
xres_12,yres_12,[0.0,0.0,0.0],...
xV1_1,yV1_1,[0.0,0.0,0.0],...
xV1_2,yV1_2,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
'LineStyle','None')

text(x01+0.3,y01+1.2,'R_3','Color',[0.9,0.2,0.0])
text(x07+1.3,y07,'R_{3}(I_{1}+I_{2})+V','Color',[0.0,0.2,0.9])
text(-10.0,y01,'a','Color',[0.9,0.0,0.0])
text(-10.0,-7.1,'b','Color',[0.9,0.0,0.0])

axis([-12,12,-12,12])
axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
else
end

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

% --- Executes on button press in pushbutton3.
function pushbutton3_Callback(hObject, eventdata, handles)
% hObject handle to pushbutton3 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
global snmeio;

snmeio=snmeio-1;

if (snmeio==0)
snmeio=4;
end

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
if (snmeio==1)
axes(handles.axes1);
cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];

```

```

y_tableau=[-11,-11,9,9];

x01=-1;
y01=2;
th1=0;

xres_11=x01+[0.40*sin(th1),0.40*sin(th1)+1.2*cos(th1),...
-0.40*sin(th1)+1.2*cos(th1),-0.40*sin(th1)];
yres_11=y01+[-0.40*cos(th1),-0.40*cos(th1)+1.2*sin(th1),...
0.40*cos(th1)+1.2*sin(th1),0.40*cos(th1)];

xres_12=x01+[-0.05*sin(th1),-0.05*sin(th1)+0.25*cos(th1),...
-0.40*sin(th1)+0.3*cos(th1),...
0.25*sin(th1)+0.45*cos(th1),...
-0.40*sin(th1)+0.6*cos(th1),...
0.25*sin(th1)+0.75*cos(th1),...
-0.40*sin(th1)+0.9*cos(th1),...
-0.05*sin(th1)+0.95*cos(th1),...
-0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+0.95*cos(th1),...
-0.25*sin(th1)+0.9*cos(th1),...
0.40*sin(th1)+0.75*cos(th1),...
-0.25*sin(th1)+0.6*cos(th1),...
0.40*sin(th1)+0.45*cos(th1),...
-0.25*sin(th1)+0.3*cos(th1),...
0.05*sin(th1)+0.25*cos(th1),...
0.05*sin(th1)];
yres_12=y01+[0.05*cos(th1),0.05*cos(th1)+0.25*sin(th1),...
0.40*cos(th1)+0.3*sin(th1),...
-0.25*cos(th1)+0.45*sin(th1),...
0.40*cos(th1)+0.6*sin(th1),...
-0.25*cos(th1)+0.75*sin(th1),...
0.40*cos(th1)+0.9*sin(th1),...
0.05*cos(th1)+0.95*sin(th1),...
0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+0.95*sin(th1),...
0.25*cos(th1)+0.9*sin(th1),...
-0.40*cos(th1)+0.75*sin(th1),...
0.25*cos(th1)+0.6*sin(th1),...
-0.40*cos(th1)+0.45*sin(th1),...
0.25*cos(th1)+0.3*sin(th1),...
-0.05*cos(th1)+0.25*sin(th1),...
-0.05*cos(th1)];
x02=-5;
y02=-1;
th2=pi/2;

xres_21=x02+[0.25*sin(th2),0.25*sin(th2)+1.6*cos(th2),...
-0.25*sin(th2)+1.6*cos(th2),-0.25*sin(th2)];
yres_21=y02+[-0.25*cos(th2),-0.25*cos(th2)+1.6*sin(th2),...
0.25*cos(th2)+1.6*sin(th2),0.25*cos(th2)];

xres_22=x02+[-0.03*sin(th2),-0.03*sin(th2)+0.33*cos(th2),...
-0.25*sin(th2)+0.4*cos(th2),...
0.10*sin(th2)+0.6*cos(th2),...
-0.25*sin(th2)+0.8*cos(th2),...
0.10*sin(th2)+1.0*cos(th2),...
-0.25*sin(th2)+1.2*cos(th2),...
-0.03*sin(th2)+1.27*cos(th2),...
-0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.27*cos(th2),...
-0.10*sin(th2)+1.2*cos(th2),...
0.25*sin(th2)+1.0*cos(th2),...
-0.10*sin(th2)+0.8*cos(th2),...
0.25*sin(th2)+0.6*cos(th2),...
-0.10*sin(th2)+0.4*cos(th2),...
0.03*sin(th2)+0.33*cos(th2),...
0.03*sin(th2)];
yres_22=y02+[0.03*cos(th2),0.03*cos(th2)+0.33*sin(th2),...
0.25*cos(th2)+0.4*sin(th2),...
-0.10*cos(th2)+0.6*sin(th2),...
0.25*cos(th2)+0.8*sin(th2),...
-0.10*cos(th2)+1.0*sin(th2),...
0.25*cos(th2)+1.2*sin(th2),...
0.03*cos(th2)+1.27*sin(th2),...
0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.27*sin(th2),...

```

```

0.10*cos(th2)+1.2*sin(th2),...
-0.25*cos(th2)+1.0*sin(th2),...
0.10*cos(th2)+0.8*sin(th2),...
-0.25*cos(th2)+0.6*sin(th2),...
0.10*cos(th2)+0.4*sin(th2),...
-0.03*cos(th2)+0.33*sin(th2),...
-0.03*cos(th2)];

x03=3.5;
y03=-2;
th3=pi/2;

xres_31=x03+[0.25*sin(th3),0.25*sin(th3)+1.6*cos(th3),...
-0.25*sin(th3)+1.6*cos(th3),-0.25*sin(th3)];
yres_31=y03+[-0.25*cos(th3),-0.25*cos(th3)+1.6*sin(th3),...
0.25*cos(th3)+1.6*sin(th3),0.25*cos(th3)];

xres_32=x03+[-0.03*sin(th3),-0.03*sin(th3)+0.33*cos(th3),...
-0.25*sin(th3)+0.4*cos(th3),...
0.10*sin(th3)+0.6*cos(th3),...
-0.25*sin(th3)+0.8*cos(th3),...
0.10*sin(th3)+1.0*cos(th3),...
-0.25*sin(th3)+1.2*cos(th3),...
-0.03*sin(th3)+1.27*cos(th3),...
-0.03*sin(th3)+1.6*cos(th3),...
0.03*sin(th3)+1.6*cos(th3),...
0.03*sin(th3)+1.27*cos(th3),...
-0.10*sin(th3)+1.2*cos(th3),...
0.25*sin(th3)+1.0*cos(th3),...
-0.10*sin(th3)+0.8*cos(th3),...
0.25*sin(th3)+0.6*cos(th3),...
-0.10*sin(th3)+0.4*cos(th3),...
0.03*sin(th3)+0.33*cos(th3),...
0.03*sin(th3)];
yres_32=y03+[0.03*cos(th3),0.03*cos(th3)+0.33*sin(th3),...
0.25*cos(th3)+0.4*sin(th3),...
-0.10*cos(th3)+0.6*sin(th3),...
0.25*cos(th3)+0.8*sin(th3),...
-0.10*cos(th3)+1.0*sin(th3),...
0.25*cos(th3)+1.2*sin(th3),...
0.03*cos(th3)+1.27*sin(th3),...
0.03*cos(th3)+1.6*sin(th3),...
-0.03*cos(th3)+1.6*sin(th3),...
-0.03*cos(th3)+1.27*sin(th3),...
0.10*cos(th3)+1.2*sin(th3),...
-0.25*cos(th3)+1.0*sin(th3),...
0.10*cos(th3)+0.8*sin(th3),...
-0.25*cos(th3)+0.6*sin(th3),...
0.10*cos(th3)+0.4*sin(th3),...
-0.03*cos(th3)+0.33*sin(th3),...
-0.03*cos(th3)];

x04=-5.0;
y04=-4;
phi4=0:0.01:2*pi;

xI1_1=x04+0.6*cos(phi4);
yI1_1=y04+0.9*sin(phi4);

xI1_2=x04+0.55*cos(phi4);
yI1_2=y04+0.85*sin(phi4);

xI1_3=x04+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI1_3=y04+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

x05=6.5;
y05=-1.25;
phi5=0:0.01:2*pi;

xI2_1=x05+0.6*cos(phi5);
yI2_1=y05+0.9*sin(phi5);

xI2_2=x05+0.55*cos(phi5);
yI2_2=y05+0.85*sin(phi5);

xI2_3=x05+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI2_3=y05+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

x06=-0.5;

```

```

y06=5.5;

xV3_1=x06+[-0.032,0.032,0.032,-0.032]+0.1-0.3;
yV3_1=y06+[-1.5,-1.5,1.5,1.5];

xV3_2=x06+[-0.05,0.05,0.05,-0.05]-0.2+0.3;
yV3_2=y06+[-0.75,-0.75,0.75,0.75];

xcable1=[-9.5,-9.5,x01,x01];
ycable1=y01+[0.1,-0.1,-0.1,0.1];

xcable2=x02+[-0.05,0.05,0.05,-0.05];
ycable2=[y02+1.6,y02+1.6,y06+0.1,y06+0.1];

xcable3=x02+[-0.05,0.05,0.05,-0.05];
ycable3=[y02,y02,y04+0.9,y04+0.9];

xcable4=x02+[-0.05,0.05,0.05,-0.05];
ycable4=[-7.0,-7.0,y04-0.9,y04-0.9];

xcable5=[-9.5,-9.5,x05,x05];
ycable5=-7.0+[0.1,-0.1,-0.1,0.1];

xcable6=x05+[-0.05,0.05,0.05,-0.05];
ycable6=[-7.1,-7.1,y05-0.9,y05-0.9];

xcable7=x05+[-0.05,0.05,0.05,-0.05];
ycable7=[y01+0.1,y01+0.1,y05+0.9,y05+0.9];

xcable8=[x01+1.2,x01+1.2,x05,x05];
ycable8=y01+[0.1,-0.1,-0.1,0.1];

xcable9=x03+[-0.05,0.05,0.05,-0.05];
ycable9=[-7.1,-7.1,y03,y03];

xcable10=x03+[-0.05,0.05,0.05,-0.05];
ycable10=[y06+0.1,y06+0.1,y03+1.6,y03+1.6];

xcable11=[x06-0.232,x06-0.232,x02,x02];
ycable11=y06+[0.1,-0.1,-0.1,0.1];

xcable12=[x06+0.15,x06+0.15,x03,x03];
ycable12=y06+[0.1,-0.1,-0.1,0.1];

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_11,yres_11,[1.0,1.0,1.0],...
xres_12,yres_12,[0.0,0.0,0.0],...
xres_21,yres_21,[1.0,1.0,1.0],...
xres_22,yres_22,[0.0,0.0,0.0],...
xres_31,yres_31,[1.0,1.0,1.0],...
xres_32,yres_32,[0.0,0.0,0.0],...
xi1_1,yi1_1,[0.0,0.0,0.0],...
xi1_2,yi1_2,[1.0,1.0,1.0],...
xi1_3,yi1_3,[0.0,0.0,0.0],...
xi2_1,yi2_1,[0.0,0.0,0.0],...
xi2_2,yi2_2,[1.0,1.0,1.0],...
xi2_3,yi2_3,[0.0,0.0,0.0],...
xV3_1,yV3_1,[0.0,0.0,0.0],...
xV3_2,yV3_2,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
xcable10,ycable10,[0.8,0.6,0.2],...
xcable11,ycable11,[0.8,0.6,0.2],...
xcable12,ycable12,[0.8,0.6,0.2],...
'LineStyle','None')

text(-11,11,'Η αντίσταση R_{1} είναι παράλληλα συνδεδεμένη με πηγή τάσης και άρα απαλείφεται. Επίσης η
αντίσταση R_{2} είναι ')
text(-11,10,'σε σειρά με πηγή ρεύματος οπότε παραλείπεται επίσης. Αντικαθιστούμε τις R_{3}, I_{2} με το
ισοδύναμό τους κατά Thevenin. Έχουμε')

```

```

text(x01+0.5,y01-1.3,'R_1','Color',[0.9,0.2,0.0])
text(x02+0.5,y02+0.8,'R_2','Color',[0.9,0.2,0.0])
text(x03+0.5,y03+0.8,'R_3','Color',[0.9,0.2,0.0])
text(x04+1.0,y04,'I_1','Color',[0.7,0.0,0.7])
text(x05+1.0,y05,'I_2','Color',[0.7,0.0,0.7])
text(x06+0.5,y06+1.0,'V','Color',[0.0,0.2,0.9])
text(-10.0,y01,'a','Color',[0.9,0.0,0.0])
text(-10.0,-7.1,'b','Color',[0.9,0.0,0.0])

axis([-12,12,-12,12])
axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
elseif (snmeio==2)
axes(handles.axes1);
cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=-12,12,12,-12];
y_back=-12,-12,12,12];

x_tableau=-11,11,11,-11];
y_tableau=-11,-11,9,9];

x01=1;
y01=2;
th1=0;

xres_11=x01+[0.40*sin(th1),0.40*sin(th1)+1.2*cos(th1),...
-0.40*sin(th1)+1.2*cos(th1),-0.40*sin(th1)];
yres_11=y01+[-0.40*cos(th1),-0.40*cos(th1)+1.2*sin(th1),...
0.40*cos(th1)+1.2*sin(th1),0.40*cos(th1)];

xres_12=x01+[-0.05*sin(th1),-0.05*sin(th1)+0.25*cos(th1),...
-0.40*sin(th1)+0.3*cos(th1),...
0.25*sin(th1)+0.45*cos(th1),...
-0.40*sin(th1)+0.6*cos(th1),...
0.25*sin(th1)+0.75*cos(th1),...
-0.40*sin(th1)+0.9*cos(th1),...
-0.05*sin(th1)+0.95*cos(th1),...
-0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+0.95*cos(th1),...
-0.25*sin(th1)+0.9*cos(th1),...
0.40*sin(th1)+0.75*cos(th1),...
-0.25*sin(th1)+0.6*cos(th1),...
0.40*sin(th1)+0.45*cos(th1),...
-0.25*sin(th1)+0.3*cos(th1),...
0.05*sin(th1)+0.25*cos(th1),...
0.05*sin(th1)];
yres_12=y01+[0.05*cos(th1),0.05*cos(th1)+0.25*sin(th1),...
0.40*cos(th1)+0.3*sin(th1),...
-0.25*cos(th1)+0.45*sin(th1),...
0.40*cos(th1)+0.6*sin(th1),...
-0.250*cos(th1)+0.75*sin(th1),...
0.40*cos(th1)+0.9*sin(th1),...
0.05*cos(th1)+0.95*sin(th1),...
0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+0.95*sin(th1),...
0.25*cos(th1)+0.9*sin(th1),...
-0.40*cos(th1)+0.75*sin(th1),...
0.25*cos(th1)+0.6*sin(th1),...
-0.40*cos(th1)+0.45*sin(th1),...
0.25*cos(th1)+0.3*sin(th1),...
-0.05*cos(th1)+0.25*sin(th1),...
-0.05*cos(th1)];

x04=-5.0;
y04=-2;
phi4=0:0.01:2*pi;

xI1_1=x04+0.6*cos(phi4);
yI1_1=y04+0.9*sin(phi4);

xI1_2=x04+0.55*cos(phi4);
yI1_2=y04+0.85*sin(phi4);

xI1_3=x04+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];

```

```

yI1_3=y04+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

x06=-1.5;
y06=y01;

xV3_1=x06+[-0.032,0.032,0.032,-0.032]+0.1-0.3;
yV3_1=y06+[-1.5,-1.5,1.5,1.5];

xV3_2=x06+[-0.05,0.05,0.05,-0.05]-0.2+0.3;
yV3_2=y06+[-0.75,-0.75,0.75,0.75];

x07=6.5;
y07=-2.0;

xV1_1=x07+[-1.0,1.0,1.0,-1.0];
yV1_1=y07+[-0.05,-0.05,0.05,0.05]+0.3;

xV1_2=x07+[-0.4,0.4,0.4,-0.4];
yV1_2=y07+[-0.1,-0.1,0.1,0.1]-0.1;

xcable1=[-9.5,-9.5,x06-0.232,x06-0.232];
ycable1=y01+[0.1,-0.1,-0.1,0.1];

xcable2=[x01,x01,x06+0.15,x06+0.15];
ycable2=y01+[0.1,-0.1,-0.1,0.1];

xcable3=[x01+1.2,x01+1.2,x07,x07];
ycable3=y01+[0.1,-0.1,-0.1,0.1];

xcable4=x07+[-0.05,0.05,0.05,-0.05];
ycable4=[y01+0.1,y01+0.1,y07+0.35,y07+0.35];

xcable5=x07+[-0.05,0.05,0.05,-0.05];
ycable5=[-7.0,-7.0,y07-0.2,y07-0.2];

xcable6=[-9.5,-9.5,x07,x07];
ycable6=-7.0+[0.1,-0.1,-0.1,0.1];

xcable7=x04+[-0.05,0.05,0.05,-0.05];
ycable7=[y01+0.1,y01+0.1,y04+0.9,y04+0.9];

xcable8=x04+[-0.05,0.05,0.05,-0.05];
ycable8=[-7.0,-7.0,y04-0.9,y04-0.9];

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_11,yres_11,[1.0,1.0,1.0],...
xres_12,yres_12,[0.0,0.0,0.0],...
xI1_1,yI1_1,[0.0,0.0,0.0],...
xI1_2,yI1_2,[1.0,1.0,1.0],...
xI1_3,yI1_3,[0.0,0.0,0.0],...
xV3_1,yV3_1,[0.0,0.0,0.0],...
xV3_2,yV3_2,[0.0,0.0,0.0],...
xV1_1,yV1_1,[0.0,0.0,0.0],...
xV1_2,yV1_2,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
'LineStyle','None')

text(-11,11,'Προσθέτουμε τις πηγές τάσης V και R_{3}I_{2} και σχηματίζουμε το κατά Norton ισοδύναμο του
κυκλώματος. Θα έχουμε')

text(x01+0.3,y01+1.2,'R_3','Color',[0.9,0.2,0.0])
text(x06+0.5,y06+1.0,'V','Color',[0.0,0.2,0.9])
text(x04+1.0,y04,'I_1','Color',[0.7,0.0,0.7])
text(x07+1.3,y07,'R_{3}I_{2}','Color',[0.0,0.2,0.9])
text(-10.0,y01,'a','Color',[0.9,0.0,0.0])
text(-10.0,-7.1,'b','Color',[0.9,0.0,0.0])

```



```

axis([-12,12,-12,12])
axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
elseif (snmeio==3)
axes(handles.axes1);
cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,9,9];

x01=1;
y01=2;
th1=0;

x03=6.5;
y03=-3;
th3=pi/2;

xres_31=x03+[0.25*sin(th3),0.25*sin(th3)+1.6*cos(th3),...
-0.25*sin(th3)+1.6*cos(th3),-0.25*sin(th3)];
yres_31=y03+[-0.25*cos(th3),-0.25*cos(th3)+1.6*sin(th3),...
0.25*cos(th3)+1.6*sin(th3),0.25*cos(th3)];

xres_32=x03+[-0.03*sin(th3),-0.03*sin(th3)+0.33*cos(th3),...
-0.25*sin(th3)+0.4*cos(th3),...
0.10*sin(th3)+0.6*cos(th3),...
-0.25*sin(th3)+0.8*cos(th3),...
0.10*sin(th3)+1.0*cos(th3),...
-0.25*sin(th3)+1.2*cos(th3),...
-0.03*sin(th3)+1.27*cos(th3),...
-0.03*sin(th3)+1.6*cos(th3),...
0.03*sin(th3)+1.6*cos(th3),...
0.03*sin(th3)+1.27*cos(th3),...
-0.10*sin(th3)+1.2*cos(th3),...
0.25*sin(th3)+1.0*cos(th3),...
-0.10*sin(th3)+0.8*cos(th3),...
0.25*sin(th3)+0.6*cos(th3),...
-0.10*sin(th3)+0.4*cos(th3),...
0.03*sin(th3)+0.33*cos(th3),...
0.03*sin(th3)];
yres_32=y03+[0.03*cos(th3),0.03*cos(th3)+0.33*sin(th3),...
0.25*cos(th3)+0.4*sin(th3),...
-0.10*cos(th3)+0.6*sin(th3),...
0.25*cos(th3)+0.8*sin(th3),...
-0.10*cos(th3)+1.0*sin(th3),...
0.25*cos(th3)+1.2*sin(th3),...
0.03*cos(th3)+1.27*sin(th3),...
0.03*cos(th3)+1.6*sin(th3),...
-0.03*cos(th3)+1.6*sin(th3),...
-0.03*cos(th3)+1.27*sin(th3),...
0.10*cos(th3)+1.2*sin(th3),...
-0.25*cos(th3)+1.0*sin(th3),...
0.10*cos(th3)+0.8*sin(th3),...
-0.25*cos(th3)+0.6*sin(th3),...
0.10*cos(th3)+0.4*sin(th3),...
-0.03*cos(th3)+0.33*sin(th3),...
-0.03*cos(th3)];

x04=-5.0;
y04=-2;
phi4=0:0.01:2*pi;

xI1_1=x04+0.6*cos(phi4);
yI1_1=y04+0.9*sin(phi4);

xI1_2=x04+0.55*cos(phi4);
yI1_2=y04+0.85*sin(phi4);

xI1_3=x04+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI1_3=y04+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

```

```

x06=-1.5;
y06=y01;

x07=6.5;
y07=-2.0;

x08=0.0;
y08=-2;
phi8=0:0.01:2*pi;

xI2_1=x08+0.6*cos(phi8);
yI2_1=y08+0.9*sin(phi8);

xI2_2=x08+0.55*cos(phi8);
yI2_2=y08+0.85*sin(phi8);

xI2_3=x08+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI2_3=y08+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

xcable1=[-9.5,-9.5,x06+0.15,x06+0.15];
ycable1=y01+[0.1,-0.1,-0.1,0.1];

xcable2=[x01,x01,x06+0.15,x06+0.15];
ycable2=y01+[0.1,-0.1,-0.1,0.1];

xcable3=[x01,x01,x07,x07];
ycable3=y01+[0.1,-0.1,-0.1,0.1];

xcable4=x07+[-0.05,0.05,0.05,-0.05];
ycable4=[y01+0.1,y01+0.1,y07+0.35,y07+0.35];

xcable5=x07+[-0.05,0.05,0.05,-0.05];
ycable5=[-7.0,-7.0,y03,y03];

xcable5_1=x07+[-0.05,0.05,0.05,-0.05];
ycable5_1=[y01,y01,y03+1.6,y03+1.6];

xcable6=[-9.5,-9.5,x07,x07];
ycable6=-7.0+[0.1,-0.1,-0.1,0.1];

xcable7=x04+[-0.05,0.05,0.05,-0.05];
ycable7=[y01+0.1,y01+0.1,y04+0.9,y04+0.9];

xcable8=x04+[-0.05,0.05,0.05,-0.05];
ycable8=[-7.0,-7.0,y04-0.9,y04-0.9];

xcable9=x08+[-0.05,0.05,0.05,-0.05];
ycable9=[y01+0.1,y01+0.1,y04+0.9,y04+0.9];

xcable10=x08+[-0.05,0.05,0.05,-0.05];
ycable10=[-7.0,-7.0,y04-0.9,y04-0.9];

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_31,yres_31,[1.0,1.0,1.0],...
xres_32,yres_32,[0.0,0.0,0.0],...
xI1_1,yI1_1,[0.0,0.0,0.0],...
xI1_2,yI1_2,[1.0,1.0,1.0],...
xI1_3,yI1_3,[0.0,0.0,0.0],...
xI2_1,yI2_1,[0.0,0.0,0.0],...
xI2_2,yI2_2,[1.0,1.0,1.0],...
xI2_3,yI2_3,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable5_1,ycable5_1,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
xcable10,ycable10,[0.8,0.6,0.2],...
'LineStyle','None')

```

```

text(-11,11,'Προσθέτουμε τις δύο πηγές ρεύματος και μετασχηματίζουμε στο κατά Thevenin ισοδύναμό του, οπότε
έχουμε')

text(x04+1.0,y04,'I_1','Color',[0.7,0.0,0.7])
text(x07+1.3,y07,'R_{3}','Color',[0.9,0.2,0.0])
text(-10.0,y01,'a','Color',[0.9,0.0,0.0])
text(-10.0,-7.1,'b','Color',[0.9,0.0,0.0])
text(x08+1.0,y08,'I_{2}+(V/R_{3})','Color',[0.7,0.0,0.7])

axis([-12,12,-12,12])
axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
elseif (snmeio==4)
axes(handles.axes1);
cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,9,9];

x01=1;
y01=2;
th1=0;

xres_11=x01+[0.40*sin(th1),0.40*sin(th1)+1.2*cos(th1),...
-0.40*sin(th1)+1.2*cos(th1),-0.40*sin(th1)];
yres_11=y01+[-0.40*cos(th1),-0.40*cos(th1)+1.2*sin(th1),...
0.40*cos(th1)+1.2*sin(th1),0.40*cos(th1)];

xres_12=x01+[-0.05*sin(th1),-0.05*sin(th1)+0.25*cos(th1),...
-0.40*sin(th1)+0.3*cos(th1),...
0.25*sin(th1)+0.45*cos(th1),...
-0.40*sin(th1)+0.6*cos(th1),...
0.25*sin(th1)+0.75*cos(th1),...
-0.40*sin(th1)+0.9*cos(th1),...
-0.05*sin(th1)+0.95*cos(th1),...
-0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+0.95*cos(th1),...
-0.25*sin(th1)+0.9*cos(th1),...
0.40*sin(th1)+0.75*cos(th1),...
-0.25*sin(th1)+0.6*cos(th1),...
0.40*sin(th1)+0.45*cos(th1),...
-0.25*sin(th1)+0.3*cos(th1),...
0.05*sin(th1)+0.25*cos(th1),...
0.05*sin(th1)];
yres_12=y01+[0.05*cos(th1),0.05*cos(th1)+0.25*sin(th1),...
0.40*cos(th1)+0.3*sin(th1),...
-0.25*cos(th1)+0.45*sin(th1),...
0.40*cos(th1)+0.6*sin(th1),...
-0.250*cos(th1)+0.75*sin(th1),...
0.40*cos(th1)+0.9*sin(th1),...
0.05*cos(th1)+0.95*sin(th1),...
0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+0.95*sin(th1),...
0.25*cos(th1)+0.9*sin(th1),...
-0.40*cos(th1)+0.75*sin(th1),...
0.25*cos(th1)+0.6*sin(th1),...
-0.40*cos(th1)+0.45*sin(th1),...
0.25*cos(th1)+0.3*sin(th1),...
-0.05*cos(th1)+0.25*sin(th1),...
-0.05*cos(th1)];

x04=-5.0;
y04=-2;
phi4=0:0.01:2*pi;

x06=-1.5;
y06=y01;

x07=6.5;
y07=-2.0;

xv1_1=x07+[-1.0,1.0,1.0,-1.0];
yv1_1=y07+[-0.05,-0.05,0.05,0.05]+0.3;

```

```

        xV1_2=x07+[-0.4,0.4,0.4,-0.4];
        yV1_2=y07+[-0.1,-0.1,0.1,0.1]-0.1;

xcable1=[-9.5,-9.5,x06+0.15,x06+0.15];
ycable1=y01+[0.1,-0.1,-0.1,0.1];

xcable2=[x01,x01,x06+0.15,x06+0.15];
ycable2=y01+[0.1,-0.1,-0.1,0.1];

xcable3=[x01+1.2,x01+1.2,x07,x07];
ycable3=y01+[0.1,-0.1,-0.1,0.1];

xcable4=x07+[-0.05,0.05,0.05,-0.05];
ycable4=[y01+0.1,y01+0.1,y07+0.35,y07+0.35];

xcable5=x07+[-0.05,0.05,0.05,-0.05];
ycable5=[-7.0,-7.0,y07-0.2,y07-0.2];

xcable6=[-9.5,-9.5,x07,x07];
ycable6=-7.0+[0.1,-0.1,-0.1,0.1];

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_11,yres_11,[1.0,1.0,1.0],...
xres_12,yres_12,[0.0,0.0,0.0],...
xV1_1,yV1_1,[0.0,0.0,0.0],...
xV1_2,yV1_2,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
'LineStyle','None')

text(x01+0.3,y01+1.2,'R_3','Color',[0.9,0.2,0.0])
text(x07+1.3,y07,'R_{3}(I_{1}+I_{2})+V','Color',[0.0,0.2,0.9])
text(-10.0,y01,'a','Color',[0.9,0.0,0.0])
text(-10.0,-7.1,'b','Color',[0.9,0.0,0.0])

axis([-12,12,-12,12])
axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
else
end

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

% --- Executes on button press in pushbutton4.
function pushbutton4_Callback(hObject, eventdata, handles)
% hObject handle to pushbutton4 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)
hfin=questdlg('Εξόδοσ από το πρόγραμμα?');
switch hfin
case 'Yes'
closereq;
end

```

Άσκηση 6

```
function varargout = g_asknsn_6(varargin)
```

```

% G_ASKNSN_6 M-file for g_asknsn_6.fig
% G_ASKNSN_6, by itself, creates a new G_ASKNSN_6 or raises the existing
% singleton*.
%
% H = G_ASKNSN_6 returns the handle to a new G_ASKNSN_6 or the handle to
% the existing singleton*.
%
% G_ASKNSN_6('CALLBACK',hObject,eventData,handles,...) calls the local
% function named CALLBACK in G_ASKNSN_6.M with the given input arguments.
%
% G_ASKNSN_6('Property','Value',...) creates a new G_ASKNSN_6 or raises the
% existing singleton*. Starting from the left, property value pairs are
% applied to the GUI before g_asknsn_6_OpeningFcn gets called. An
% unrecognized property name or invalid value makes property application
% stop. All inputs are passed to g_asknsn_6_OpeningFcn via varargin.
%
% *See GUI Options on GUIDE's Tools menu. Choose "GUI allows only one
% instance to run (singleton)".
%
% See also: GUIDE, GUIDATA, GUIHANDLES

% Edit the above text to modify the response to help g_asknsn_6

% Last Modified by GUIDE v2.5 15-Dec-2013 23:30:17

% Begin initialization code - DO NOT EDIT
gui_Singleton = 1;
gui_State = struct('gui_Name', mfilename, ...
    'gui_Singleton', gui_Singleton, ...
    'gui_OpeningFcn', @g_asknsn_6_OpeningFcn, ...
    'gui_OutputFcn', @g_asknsn_6_OutputFcn, ...
    'gui_LayoutFcn', [] , ...
    'gui_Callback', []);
if nargin && ischar(varargin{1})
    gui_State.gui_Callback = str2func(varargin{1});
end

if nargout
    [varargout{1:nargout}] = gui_mainfcn(gui_State, varargin{:});
else
    gui_mainfcn(gui_State, varargin{:});
end
% End initialization code - DO NOT EDIT

% --- Executes just before g_asknsn_6 is made visible.
function g_asknsn_6_OpeningFcn(hObject, eventdata, handles, varargin)
% This function has no output args, see OutputFcn.
% hObject handle to figure
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)
% varargin command line arguments to g_asknsn_6 (see VARARGIN)

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,9,9];

x05=-7;
y05=2;
th5=0;

xres_51=x05+[0.40*sin(th5),0.40*sin(th5)+1.2*cos(th5),...
    -0.40*sin(th5)+1.2*cos(th5),-0.40*sin(th5)];
yres_51=y05+[-0.40*cos(th5),-0.40*cos(th5)+1.2*sin(th5),...
    0.40*cos(th5)+1.2*sin(th5),0.40*cos(th5)];

xres_52=x05+[-0.05*sin(th5),-0.05*sin(th5)+0.25*cos(th5),...
    -0.40*sin(th5)+0.3*cos(th5),...
    0.25*sin(th5)+0.45*cos(th5),...
    -0.40*sin(th5)+0.6*cos(th5),...
    0.25*sin(th5)+0.75*cos(th5),...
    -0.40*sin(th5)+0.9*cos(th5),...
    -0.05*sin(th5)+0.95*cos(th5),...
    -0.05*sin(th5)+1.2*cos(th5),...
    0.05*sin(th5)+1.2*cos(th5),...
    0.05*sin(th5)+0.95*cos(th5),...
    -0.25*sin(th5)+0.9*cos(th5),...
    0.40*sin(th5)+0.75*cos(th5),...

```

```

-0.25*sin(th5)+0.6*cos(th5),...
0.40*sin(th5)+0.45*cos(th5),...
-0.25*sin(th5)+0.3*cos(th5),...
0.05*sin(th5)+0.25*cos(th5),...
0.05*sin(th5)];
yres_52=y05+[0.05*cos(th5),0.05*cos(th5)+0.25*sin(th5),...
0.40*cos(th5)+0.3*sin(th5),...
-0.25*cos(th5)+0.45*sin(th5),...
0.40*cos(th5)+0.6*sin(th5),...
-0.250*cos(th5)+0.75*sin(th5),...
0.40*cos(th5)+0.9*sin(th5),...
0.05*cos(th5)+0.95*sin(th5),...
0.05*cos(th5)+1.2*sin(th5),...
-0.05*cos(th5)+1.2*sin(th5),...
-0.05*cos(th5)+0.95*sin(th5),...
0.25*cos(th5)+0.9*sin(th5),...
-0.40*cos(th5)+0.75*sin(th5),...
0.25*cos(th5)+0.6*sin(th5),...
-0.40*cos(th5)+0.45*sin(th5),...
0.25*cos(th5)+0.3*sin(th5),...
-0.05*cos(th5)+0.25*sin(th5),...
-0.05*cos(th5)];

x03=-2;
y03=2;
th3=0;

xres_31=x03+[0.40*sin(th3),0.40*sin(th3)+1.2*cos(th3),...
-0.40*sin(th3)+1.2*cos(th3),-0.40*sin(th3)];
yres_31=y03+[-0.40*cos(th3),-0.40*cos(th3)+1.2*sin(th3),...
0.40*cos(th3)+1.2*sin(th3),0.40*cos(th3)];

xres_32=x03+[-0.05*sin(th3),-0.05*sin(th3)+0.25*cos(th3),...
-0.40*sin(th3)+0.3*cos(th3),...
0.25*sin(th3)+0.45*cos(th3),...
-0.40*sin(th3)+0.6*cos(th3),...
0.25*sin(th3)+0.75*cos(th3),...
-0.40*sin(th3)+0.9*cos(th3),...
-0.05*sin(th3)+0.95*cos(th3),...
-0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+0.95*cos(th3),...
-0.25*sin(th3)+0.9*cos(th3),...
0.40*sin(th3)+0.75*cos(th3),...
-0.25*sin(th3)+0.6*cos(th3),...
0.40*sin(th3)+0.45*cos(th3),...
-0.25*sin(th3)+0.3*cos(th3),...
0.05*sin(th3)+0.25*cos(th3),...
0.05*sin(th3)];
yres_32=y03+[0.05*cos(th3),0.05*cos(th3)+0.25*sin(th3),...
0.40*cos(th3)+0.3*sin(th3),...
-0.25*cos(th3)+0.45*sin(th3),...
0.40*cos(th3)+0.6*sin(th3),...
-0.250*cos(th3)+0.75*sin(th3),...
0.40*cos(th3)+0.9*sin(th3),...
0.05*cos(th3)+0.95*sin(th3),...
0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+0.95*sin(th3),...
0.25*cos(th3)+0.9*sin(th3),...
-0.40*cos(th3)+0.75*sin(th3),...
0.25*cos(th3)+0.6*sin(th3),...
-0.40*cos(th3)+0.45*sin(th3),...
0.25*cos(th3)+0.3*sin(th3),...
-0.05*cos(th3)+0.25*sin(th3),...
-0.05*cos(th3)];

x04=-2;
y04=7;
th4=0;

xres_41=x04+[0.40*sin(th4),0.40*sin(th4)+1.2*cos(th4),...
-0.40*sin(th4)+1.2*cos(th4),-0.40*sin(th4)];
yres_41=y04+[-0.40*cos(th4),-0.40*cos(th4)+1.2*sin(th4),...
0.40*cos(th4)+1.2*sin(th4),0.40*cos(th4)];

xres_42=x04+[-0.05*sin(th4),-0.05*sin(th4)+0.25*cos(th4),...
-0.40*sin(th4)+0.3*cos(th4),...
0.25*sin(th4)+0.45*cos(th4),...
-0.40*sin(th4)+0.6*cos(th4),...

```

```

0.25*sin(th4)+0.75*cos(th4),...
-0.40*sin(th4)+0.9*cos(th4),...
-0.05*sin(th4)+0.95*cos(th4),...
-0.05*sin(th4)+1.2*cos(th4),...
0.05*sin(th4)+1.2*cos(th4),...
0.05*sin(th4)+0.95*cos(th4),...
-0.25*sin(th4)+0.9*cos(th4),...
0.40*sin(th4)+0.75*cos(th4),...
-0.25*sin(th4)+0.6*cos(th4),...
0.40*sin(th4)+0.45*cos(th4),...
-0.25*sin(th4)+0.3*cos(th4),...
0.05*sin(th4)+0.25*cos(th4),...
0.05*sin(th4)];
yres_42=y04+[0.05*cos(th4),0.05*cos(th4)+0.25*sin(th4),...
0.40*cos(th4)+0.3*sin(th4),...
-0.25*cos(th4)+0.45*sin(th4),...
0.40*cos(th4)+0.6*sin(th4),...
-0.250*cos(th4)+0.75*sin(th4),...
0.40*cos(th4)+0.9*sin(th4),...
0.05*cos(th4)+0.95*sin(th4),...
0.05*cos(th4)+1.2*sin(th4),...
-0.05*cos(th4)+1.2*sin(th4),...
-0.05*cos(th4)+0.95*sin(th4),...
0.25*cos(th4)+0.9*sin(th4),...
-0.40*cos(th4)+0.75*sin(th4),...
0.25*cos(th4)+0.6*sin(th4),...
-0.40*cos(th4)+0.45*sin(th4),...
0.25*cos(th4)+0.3*sin(th4),...
-0.05*cos(th4)+0.25*sin(th4),...
-0.05*cos(th4)];

x01=3;
y01=2;
th1=0;

xres_11=x01+[0.40*sin(th1),0.40*sin(th1)+1.2*cos(th1),...
-0.40*sin(th1)+1.2*cos(th1),-0.40*sin(th1)];
yres_11=y01+[-0.40*cos(th1),-0.40*cos(th1)+1.2*sin(th1),...
0.40*cos(th1)+1.2*sin(th1),0.40*cos(th1)];

xres_12=x01+[-0.05*sin(th1),-0.05*sin(th1)+0.25*cos(th1),...
-0.40*sin(th1)+0.3*cos(th1),...
0.25*sin(th1)+0.45*cos(th1),...
-0.40*sin(th1)+0.6*cos(th1),...
0.25*sin(th1)+0.75*cos(th1),...
-0.40*sin(th1)+0.9*cos(th1),...
-0.05*sin(th1)+0.95*cos(th1),...
-0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+0.95*cos(th1),...
-0.25*sin(th1)+0.9*cos(th1),...
0.40*sin(th1)+0.75*cos(th1),...
-0.25*sin(th1)+0.6*cos(th1),...
0.40*sin(th1)+0.45*cos(th1),...
-0.25*sin(th1)+0.3*cos(th1),...
0.05*sin(th1)+0.25*cos(th1),...
0.05*sin(th1)];
yres_12=y01+[0.05*cos(th1),0.05*cos(th1)+0.25*sin(th1),...
0.40*cos(th1)+0.3*sin(th1),...
-0.25*cos(th1)+0.45*sin(th1),...
0.40*cos(th1)+0.6*sin(th1),...
-0.250*cos(th1)+0.75*sin(th1),...
0.40*cos(th1)+0.9*sin(th1),...
0.05*cos(th1)+0.95*sin(th1),...
0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+0.95*sin(th1),...
0.25*cos(th1)+0.9*sin(th1),...
-0.40*cos(th1)+0.75*sin(th1),...
0.25*cos(th1)+0.6*sin(th1),...
-0.40*cos(th1)+0.45*sin(th1),...
0.25*cos(th1)+0.3*sin(th1),...
-0.05*cos(th1)+0.25*sin(th1),...
-0.05*cos(th1)];

x02=1.0;
y02=-3;
th2=pi/2;

xres_21=x02+[0.25*sin(th2),0.25*sin(th2)+1.6*cos(th2),...
-0.25*sin(th2)+1.6*cos(th2),-0.25*sin(th2)];

```

```

yres_21=y02+[-0.25*cos(th2),-0.25*cos(th2)+1.6*sin(th2),...
0.25*cos(th2)+1.6*sin(th2),0.25*cos(th2)];

xres_22=x02+[-0.03*sin(th2),-0.03*sin(th2)+0.33*cos(th2),...
-0.25*sin(th2)+0.4*cos(th2),...
0.10*sin(th2)+0.6*cos(th2),...
-0.25*sin(th2)+0.8*cos(th2),...
0.10*sin(th2)+1.0*cos(th2),...
-0.25*sin(th2)+1.2*cos(th2),...
-0.03*sin(th2)+1.27*cos(th2),...
-0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.27*cos(th2),...
-0.10*sin(th2)+1.2*cos(th2),...
0.25*sin(th2)+1.0*cos(th2),...
-0.10*sin(th2)+0.8*cos(th2),...
0.25*sin(th2)+0.6*cos(th2),...
-0.10*sin(th2)+0.4*cos(th2),...
0.03*sin(th2)+0.33*cos(th2),...
0.03*sin(th2)];

yres_22=y02+[0.03*cos(th2),0.03*cos(th2)+0.33*sin(th2),...
0.25*cos(th2)+0.4*sin(th2),...
-0.10*cos(th2)+0.6*sin(th2),...
0.25*cos(th2)+0.8*sin(th2),...
-0.10*cos(th2)+1.0*sin(th2),...
0.25*cos(th2)+1.2*sin(th2),...
0.03*cos(th2)+1.27*sin(th2),...
0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.27*sin(th2),...
0.10*cos(th2)+1.2*sin(th2),...
-0.25*cos(th2)+1.0*sin(th2),...
0.10*cos(th2)+0.8*sin(th2),...
-0.25*cos(th2)+0.6*sin(th2),...
0.10*cos(th2)+0.4*sin(th2),...
-0.03*cos(th2)+0.33*sin(th2),...
-0.03*cos(th2)];

x06=-9.0;
y06=-2.5;
phi6=0:0.01:2*pi;

xI1_1=x06+0.6*cos(phi6);
yI1_1=y06+0.9*sin(phi6);

xI1_2=x06+0.55*cos(phi6);
yI1_2=y06+0.85*sin(phi6);

xI1_3=x06+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI1_3=y06+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

x07=-1.5;
y07=4.5;

xV1_1=x07+[-0.032,0.032,0.032,-0.032]+0.1;
yV1_1=y07+[-1.5,-1.5,1.5,1.5];

xV1_2=x07+[-0.05,0.05,0.05,-0.05]-0.2;
yV1_2=y07+[-0.75,-0.75,0.75,0.75];

xcable1=[x05,x05,x06,x06];
ycable1=y05+[0.1,-0.1,-0.1,0.1];

xcable2=x06+[-0.05,0.05,0.05,-0.05];
ycable2=[y05,y05,y06+0.9,y06+0.9];

xcable3=x06+[-0.05,0.05,0.05,-0.05];
ycable3=[-6.0,-6.0,y06-0.9,y06-0.9];

xcable4=[9.0,9.0,x06,x06];
ycable4=-6.0+[0.1,-0.1,-0.1,0.1];

xcable5=[9.0,9.0,x01+1.2,x01+1.2];
ycable5=y01+[0.1,-0.1,-0.1,0.1];

xcable6=[x03+1.2,x03+1.2,x01,x01];
ycable6=y01+[0.1,-0.1,-0.1,0.1];

xcable7=[x05+1.2,x05+1.2,x03,x03];

```



```

ycable7=y01+[0.1,-0.1,-0.1,0.1];

xcable8=x02+[-0.05,0.05,0.05,-0.05];
ycable8=[y05,y05,y02+1.6,y02+1.6];

xcable9=x02+[-0.05,0.05,0.05,-0.05];
ycable9=[-6.0,-6.0,y02,y02];

xcable10=x02+[-0.05,0.05,0.05,-0.05];
ycable10=[y05,y05,y04,y04];

xcable11=x02+[-0.05,0.05,0.05,-0.05]-5.0;
ycable11=[y05,y05,y04,y04];

xcable12=[x02-5.05,x02-5.05,x04,x04];
ycable12=y04+[0.1,-0.1,-0.1,0.1];

xcable13=[x02+0.05,x02+0.05,x04+1.2,x04+1.2];
ycable13=y04+[0.1,-0.1,-0.1,0.1];

xcable14=[x02-5.05,x02-5.05,x07-0.25,x07-0.25];
ycable14=y07+[0.1,-0.1,-0.1,0.1];

xcable15=[x02+0.05,x02+0.05,x07+0.132,x07+0.132];
ycable15=y07+[0.1,-0.1,-0.1,0.1];

```

```

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_51,yres_51,[1.0,1.0,1.0],...
xres_52,yres_52,[0.0,0.0,0.0],...
xres_31,yres_31,[1.0,1.0,1.0],...
xres_32,yres_32,[0.0,0.0,0.0],...
xres_41,yres_41,[1.0,1.0,1.0],...
xres_42,yres_42,[0.0,0.0,0.0],...
xres_11,yres_11,[1.0,1.0,1.0],...
xres_12,yres_12,[0.0,0.0,0.0],...
xres_21,yres_21,[1.0,1.0,1.0],...
xres_22,yres_22,[0.0,0.0,0.0],...
xi1_1,yi1_1,[0.0,0.0,0.0],...
xi1_2,yi1_2,[1.0,1.0,1.0],...
xi1_3,yi1_3,[0.0,0.0,0.0],...
xv1_1,yv1_1,[0.0,0.0,0.0],...
xv1_2,yv1_2,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
xcable10,ycable10,[0.8,0.6,0.2],...
xcable11,ycable11,[0.8,0.6,0.2],...
xcable12,ycable12,[0.8,0.6,0.2],...
xcable13,ycable13,[0.8,0.6,0.2],...
xcable14,ycable14,[0.8,0.6,0.2],...
xcable15,ycable15,[0.8,0.6,0.2],...
'Linestyle','None')

```

```

text(-11,11,'Να προσδιοριστεί το ισοδύναμο κατά Thevenin του παρακάτω κυκλώματος από τα άκρα a, b.')
```

```

text(x01+0.5,y01+1.0,'R_1','Color',[0.9,0.2,0.0])
text(x02+0.5,y02+0.8,'R_2','Color',[0.9,0.2,0.0])
text(x03+0.5,y03-1.0,'R_3','Color',[0.9,0.2,0.0])
text(x05+0.5,y05+1.0,'R_5','Color',[0.9,0.2,0.0])
text(x04+0.5,y04+1.0,'R_4','Color',[0.9,0.2,0.0])
text(x06+1.0,y06,'J_1','Color',[0.7,0.0,0.7])
text(x07+0.5,y07+0.9,'V_1','Color',[0.0,0.2,0.9])
text(9.5,y01,'a','Color',[0.9,0.0,0.0])
text(9.5,-6.0,'b','Color',[0.9,0.0,0.0])

```

```

axis([-12,12,-12,12])
axis off;
```

```

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
```

```

        % Choose default command line output for g_asknsn_6
        handles.output = hObject;

        % Update handles structure
        guidata(hObject, handles);

    % UIWAIT makes g_asknsn_6 wait for user response (see UIRESUME)
    % uiwait(handles.figure1);

    % --- Outputs from this function are returned to the command line.
function varargout = g_asknsn_6_OutputFcn(hObject, eventdata, handles)
    % varargout cell array for returning output args (see VARARGOUT);
    % hObject     handle to figure
    % eventdata reserved - to be defined in a future version of MATLAB
    % handles     structure with handles and user data (see GUIDATA)

    % Get default command line output from handles structure
    varargout{1} = handles.output;

function edit1_Callback(hObject, eventdata, handles)
    % hObject     handle to edit1 (see GCBO)
    % eventdata reserved - to be defined in a future version of MATLAB
    % handles     structure with handles and user data (see GUIDATA)

    % Hints: get(hObject,'String') returns contents of edit1 as text
    % str2double(get(hObject,'String')) returns contents of edit1 as a double
%

    % --- Executes during object creation, after setting all properties.
function edit1_CreateFcn(hObject, eventdata, handles)
    % hObject     handle to edit1 (see GCBO)
    % eventdata reserved - to be defined in a future version of MATLAB
    % handles     empty - handles not created until after all CreateFcns called

    % Hint: edit controls usually have a white background on Windows.
    %         See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUiControlBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit2_Callback(hObject, eventdata, handles)
    % hObject     handle to edit2 (see GCBO)
    % eventdata reserved - to be defined in a future version of MATLAB
    % handles     structure with handles and user data (see GUIDATA)

    % Hints: get(hObject,'String') returns contents of edit2 as text
    % str2double(get(hObject,'String')) returns contents of edit2 as a double
%

    % --- Executes during object creation, after setting all properties.
function edit2_CreateFcn(hObject, eventdata, handles)
    % hObject     handle to edit2 (see GCBO)
    % eventdata reserved - to be defined in a future version of MATLAB
    % handles     empty - handles not created until after all CreateFcns called

    % Hint: edit controls usually have a white background on Windows.
    %         See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUiControlBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit3_Callback(hObject, eventdata, handles)
    % hObject     handle to edit3 (see GCBO)
    % eventdata reserved - to be defined in a future version of MATLAB
    % handles     structure with handles and user data (see GUIDATA)

    % Hints: get(hObject,'String') returns contents of edit3 as text
    % str2double(get(hObject,'String')) returns contents of edit3 as a double
%

    % --- Executes during object creation, after setting all properties.
function edit3_CreateFcn(hObject, eventdata, handles)
    % hObject     handle to edit3 (see GCBO)
    % eventdata reserved - to be defined in a future version of MATLAB

```

```

% handles    empty - handles not created until after all CreateFcns called

% Hint: edit controls usually have a white background on Windows.
%         See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit4_Callback(hObject, eventdata, handles)
% hObject    handle to edit4 (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit4 as text
%         str2double(get(hObject,'String')) returns contents of edit4 as a double

% --- Executes during object creation, after setting all properties.
function edit4_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit4 (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns called

% Hint: edit controls usually have a white background on Windows.
%         See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit5_Callback(hObject, eventdata, handles)
% hObject    handle to edit5 (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit5 as text
%         str2double(get(hObject,'String')) returns contents of edit5 as a double

% --- Executes during object creation, after setting all properties.
function edit5_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit5 (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns called

% Hint: edit controls usually have a white background on Windows.
%         See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit6_Callback(hObject, eventdata, handles)
% hObject    handle to edit6 (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit6 as text
%         str2double(get(hObject,'String')) returns contents of edit6 as a double

% --- Executes during object creation, after setting all properties.
function edit6_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit6 (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns called

% Hint: edit controls usually have a white background on Windows.
%         See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit7_Callback(hObject, eventdata, handles)
% hObject    handle to edit7 (see GCBO)

```

```

% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit7 as text
% str2double(get(hObject,'String')) returns contents of edit7 as a double

% --- Executes during object creation, after setting all properties.
function edit7_CreateFcn(hObject, eventdata, handles)
    % hObject handle to edit7 (see GCBO)
    % eventdata reserved - to be defined in a future version of MATLAB
    % handles empty - handles not created until after all CreateFcns called

    % Hint: edit controls usually have a white background on Windows.
    % See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUiControlBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

% --- Executes on button press in pushbutton1.
function pushbutton1_Callback(hObject, eventdata, handles)
    % hObject handle to pushbutton1 (see GCBO)
    % eventdata reserved - to be defined in a future version of MATLAB
    % handles structure with handles and user data (see GUIDATA)

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
global R1;
global R2;
global R3;
global R4;
global R5;
global V1;
global J1;

R1=str2double(get(handles.edit1,'String'));
R2=str2double(get(handles.edit2,'String'));
R3=str2double(get(handles.edit3,'String'));
R4=str2double(get(handles.edit4,'String'));
R5=str2double(get(handles.edit5,'String'));
V1=str2double(get(handles.edit6,'String'));
J1=str2double(get(handles.edit7,'String'));

if (R1>10|R1<1)
h=warndlg('Βάλτε στην αντίσταση R1 τιμή μεταξύ 1 και 10');
return
end

if (R2>10|R2<1)
h=warndlg('Βάλτε στην αντίσταση R2 τιμή μεταξύ 1 και 10');
return
end

if (R3>10|R3<1)
h=warndlg('Βάλτε στην αντίσταση R3 τιμή μεταξύ 1 και 10');
return
end

if (R4>10|R4<1)
h=warndlg('Βάλτε στην αντίσταση R4 τιμή μεταξύ 1 και 10');
return
end

if (R5>10|R5<1)
h=warndlg('Βάλτε στην αντίσταση R5 τιμή μεταξύ 1 και 10');
return
end

if (V1>15|V1<5)
h=warndlg('Βάλτε στην τάση V1 τιμή μεταξύ 5 και 15');
return
end

if (J1>5|J1<1)
h=warndlg('Βάλτε στο ρεύμα I1 τιμή μεταξύ 1 και 5');
return
end

axes(handles.axes1)

```

```

axis off;
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
global snmeio;

snmeio=1;
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
RT=R1+R2;
nRT=num2str(0.01*round(100*RT));
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,8.5,8.5];

x05=-7;
y05=2;
th5=0;

xres_51=x05+[0.40*sin(th5),0.40*sin(th5)+1.2*cos(th5),...
-0.40*sin(th5)+1.2*cos(th5),-0.40*sin(th5)];
yres_51=y05+[-0.40*cos(th5),-0.40*cos(th5)+1.2*sin(th5),...
0.40*cos(th5)+1.2*sin(th5),0.40*cos(th5)];

xres_52=x05+[-0.05*sin(th5),-0.05*sin(th5)+0.25*cos(th5),...
-0.40*sin(th5)+0.3*cos(th5),...
0.25*sin(th5)+0.45*cos(th5),...
-0.40*sin(th5)+0.6*cos(th5),...
0.25*sin(th5)+0.75*cos(th5),...
-0.40*sin(th5)+0.9*cos(th5),...
-0.05*sin(th5)+0.95*cos(th5),...
-0.05*sin(th5)+1.2*cos(th5),...
0.05*sin(th5)+1.2*cos(th5),...
0.05*sin(th5)+0.95*cos(th5),...
-0.25*sin(th5)+0.9*cos(th5),...
0.40*sin(th5)+0.75*cos(th5),...
-0.25*sin(th5)+0.6*cos(th5),...
0.40*sin(th5)+0.45*cos(th5),...
-0.25*sin(th5)+0.3*cos(th5),...
0.05*sin(th5)+0.25*cos(th5),...
0.05*sin(th5)];
yres_52=y05+[0.05*cos(th5),0.05*cos(th5)+0.25*sin(th5),...
0.40*cos(th5)+0.3*sin(th5),...
-0.25*cos(th5)+0.45*sin(th5),...
0.40*cos(th5)+0.6*sin(th5),...
-0.250*cos(th5)+0.75*sin(th5),...
0.40*cos(th5)+0.9*sin(th5),...
0.05*cos(th5)+0.95*sin(th5),...
0.05*cos(th5)+1.2*sin(th5),...
-0.05*cos(th5)+1.2*sin(th5),...
-0.05*cos(th5)+0.95*sin(th5),...
0.25*cos(th5)+0.9*sin(th5),...
-0.40*cos(th5)+0.75*sin(th5),...
0.25*cos(th5)+0.6*sin(th5),...
-0.40*cos(th5)+0.45*sin(th5),...
0.25*cos(th5)+0.3*sin(th5),...
-0.05*cos(th5)+0.25*sin(th5),...
-0.05*cos(th5)];

x03=-2;
y03=2;
th3=0;

xres_31=x03+[0.40*sin(th3),0.40*sin(th3)+1.2*cos(th3),...
-0.40*sin(th3)+1.2*cos(th3),-0.40*sin(th3)];
yres_31=y03+[-0.40*cos(th3),-0.40*cos(th3)+1.2*sin(th3),...
0.40*cos(th3)+1.2*sin(th3),0.40*cos(th3)];

xres_32=x03+[-0.05*sin(th3),-0.05*sin(th3)+0.25*cos(th3),...
-0.40*sin(th3)+0.3*cos(th3),...
0.25*sin(th3)+0.45*cos(th3),...
-0.40*sin(th3)+0.6*cos(th3),...
0.25*sin(th3)+0.75*cos(th3),...
-0.40*sin(th3)+0.9*cos(th3),...
-0.05*sin(th3)+0.95*cos(th3),...
-0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+0.95*cos(th3),...
-0.25*sin(th3)+0.9*cos(th3),...
0.40*sin(th3)+0.75*cos(th3),...
-0.25*sin(th3)+0.6*cos(th3),...
-0.05*cos(th3)+0.25*sin(th3),...
-0.05*cos(th3)];

```

```

0.40*sin(th3)+0.45*cos(th3),...
-0.25*sin(th3)+0.3*cos(th3),...
0.05*sin(th3)+0.25*cos(th3),...
0.05*sin(th3)];
yres_32=y03+[0.05*cos(th3),0.05*cos(th3)+0.25*sin(th3),...
0.40*cos(th3)+0.3*sin(th3),...
-0.25*cos(th3)+0.45*sin(th3),...
0.40*cos(th3)+0.6*sin(th3),...
-0.250*cos(th3)+0.75*sin(th3),...
0.40*cos(th3)+0.9*sin(th3),...
0.05*cos(th3)+0.95*sin(th3),...
0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+0.95*sin(th3),...
0.25*cos(th3)+0.9*sin(th3),...
-0.40*cos(th3)+0.75*sin(th3),...
0.25*cos(th3)+0.6*sin(th3),...
-0.40*cos(th3)+0.45*sin(th3),...
0.25*cos(th3)+0.3*sin(th3),...
-0.05*cos(th3)+0.25*sin(th3),...
-0.05*cos(th3)];

x04=-2;
y04=7;
th4=0;

xres_41=x04+[0.40*sin(th4),0.40*sin(th4)+1.2*cos(th4),...
-0.40*sin(th4)+1.2*cos(th4),-0.40*sin(th4)];
yres_41=y04+[-0.40*cos(th4),-0.40*cos(th4)+1.2*sin(th4),...
0.40*cos(th4)+1.2*sin(th4),0.40*cos(th4)];

xres_42=x04+[-0.05*sin(th4),-0.05*sin(th4)+0.25*cos(th4),...
-0.40*sin(th4)+0.3*cos(th4),...
0.25*sin(th4)+0.45*cos(th4),...
-0.40*sin(th4)+0.6*cos(th4),...
0.25*sin(th4)+0.75*cos(th4),...
-0.40*sin(th4)+0.9*cos(th4),...
-0.05*sin(th4)+0.95*cos(th4),...
-0.05*sin(th4)+1.2*cos(th4),...
0.05*sin(th4)+1.2*cos(th4),...
0.05*sin(th4)+0.95*cos(th4),...
-0.25*sin(th4)+0.9*cos(th4),...
0.40*sin(th4)+0.75*cos(th4),...
-0.25*sin(th4)+0.6*cos(th4),...
0.40*sin(th4)+0.45*cos(th4),...
-0.25*sin(th4)+0.3*cos(th4),...
0.05*sin(th4)+0.25*cos(th4),...
0.05*sin(th4)];
yres_42=y04+[0.05*cos(th4),0.05*cos(th4)+0.25*sin(th4),...
0.40*cos(th4)+0.3*sin(th4),...
-0.25*cos(th4)+0.45*sin(th4),...
0.40*cos(th4)+0.6*sin(th4),...
-0.250*cos(th4)+0.75*sin(th4),...
0.40*cos(th4)+0.9*sin(th4),...
0.05*cos(th4)+0.95*sin(th4),...
0.05*cos(th4)+1.2*sin(th4),...
-0.05*cos(th4)+1.2*sin(th4),...
-0.05*cos(th4)+0.95*sin(th4),...
0.25*cos(th4)+0.9*sin(th4),...
-0.40*cos(th4)+0.75*sin(th4),...
0.25*cos(th4)+0.6*sin(th4),...
-0.40*cos(th4)+0.45*sin(th4),...
0.25*cos(th4)+0.3*sin(th4),...
-0.05*cos(th4)+0.25*sin(th4),...
-0.05*cos(th4)];

x01=3;
y01=2;
th1=0;

xres_11=x01+[0.40*sin(th1),0.40*sin(th1)+1.2*cos(th1),...
-0.40*sin(th1)+1.2*cos(th1),-0.40*sin(th1)];
yres_11=y01+[-0.40*cos(th1),-0.40*cos(th1)+1.2*sin(th1),...
0.40*cos(th1)+1.2*sin(th1),0.40*cos(th1)];

xres_12=x01+[-0.05*sin(th1),-0.05*sin(th1)+0.25*cos(th1),...
-0.40*sin(th1)+0.3*cos(th1),...
0.25*sin(th1)+0.45*cos(th1),...
-0.40*sin(th1)+0.6*cos(th1),...
0.25*sin(th1)+0.75*cos(th1),...

```

```

-0.40*sin(th1)+0.9*cos(th1),...
-0.05*sin(th1)+0.95*cos(th1),...
-0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+0.95*cos(th1),...
-0.25*sin(th1)+0.9*cos(th1),...
0.40*sin(th1)+0.75*cos(th1),...
-0.25*sin(th1)+0.6*cos(th1),...
0.40*sin(th1)+0.45*cos(th1),...
-0.25*sin(th1)+0.3*cos(th1),...
0.05*sin(th1)+0.25*cos(th1),...
0.05*sin(th1)];
yres_12=y01+[0.05*cos(th1),0.05*cos(th1)+0.25*sin(th1),...
0.40*cos(th1)+0.3*sin(th1),...
-0.25*cos(th1)+0.45*sin(th1),...
0.40*cos(th1)+0.6*sin(th1),...
-0.250*cos(th1)+0.75*sin(th1),...
0.40*cos(th1)+0.9*sin(th1),...
0.05*cos(th1)+0.95*sin(th1),...
0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+0.95*sin(th1),...
0.25*cos(th1)+0.9*sin(th1),...
-0.40*cos(th1)+0.75*sin(th1),...
0.25*cos(th1)+0.6*sin(th1),...
-0.40*cos(th1)+0.45*sin(th1),...
0.25*cos(th1)+0.3*sin(th1),...
-0.05*cos(th1)+0.25*sin(th1),...
-0.05*cos(th1)];

x02=1.0;
y02=-3;
th2=pi/2;

xres_21=x02+[0.25*sin(th2),0.25*sin(th2)+1.6*cos(th2),...
-0.25*sin(th2)+1.6*cos(th2),-0.25*sin(th2)];
yres_21=y02+[-0.25*cos(th2),-0.25*cos(th2)+1.6*sin(th2),...
0.25*cos(th2)+1.6*sin(th2),0.25*cos(th2)];

xres_22=x02+[-0.03*sin(th2),-0.03*sin(th2)+0.33*cos(th2),...
-0.25*sin(th2)+0.4*cos(th2),...
0.10*sin(th2)+0.6*cos(th2),...
-0.25*sin(th2)+0.8*cos(th2),...
0.10*sin(th2)+1.0*cos(th2),...
-0.25*sin(th2)+1.2*cos(th2),...
-0.03*sin(th2)+1.27*cos(th2),...
-0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.27*cos(th2),...
-0.10*sin(th2)+1.2*cos(th2),...
0.25*sin(th2)+1.0*cos(th2),...
-0.10*sin(th2)+0.8*cos(th2),...
0.25*sin(th2)+0.6*cos(th2),...
-0.10*sin(th2)+0.4*cos(th2),...
0.03*sin(th2)+0.33*cos(th2),...
0.03*sin(th2)];
yres_22=y02+[0.03*cos(th2),0.03*cos(th2)+0.33*sin(th2),...
0.25*cos(th2)+0.4*sin(th2),...
-0.10*cos(th2)+0.6*sin(th2),...
0.25*cos(th2)+0.8*sin(th2),...
-0.10*cos(th2)+1.0*sin(th2),...
0.25*cos(th2)+1.2*sin(th2),...
0.03*cos(th2)+1.27*sin(th2),...
0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.27*sin(th2),...
0.10*cos(th2)+1.2*sin(th2),...
-0.25*cos(th2)+1.0*sin(th2),...
0.10*cos(th2)+0.8*sin(th2),...
-0.25*cos(th2)+0.6*sin(th2),...
0.10*cos(th2)+0.4*sin(th2),...
-0.03*cos(th2)+0.33*sin(th2),...
-0.03*cos(th2)];

x06=-9.0;
y06=-2.5;
phi6=0:0.01:2*pi;

xI1_1=x06+0.6*cos(phi6);
yI1_1=y06+0.9*sin(phi6);

```

```

        xI1_2=x06+0.55*cos(phi6);
        yI1_2=y06+0.85*sin(phi6);
xI1_3=x06+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI1_3=y06+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

        x07=-1.5;
        y07=4.5;

xV1_1=x07+[-0.032,0.032,0.032,-0.032]+0.1;
yV1_1=y07+[-1.5,-1.5,1.5,1.5];

xV1_2=x07+[-0.05,0.05,0.05,-0.05]-0.2;
yV1_2=y07+[-0.75,-0.75,0.75,0.75];

        xcable1=[x05,x05,x06,x06];
        ycable1=y05+[0.1,-0.1,-0.1,0.1];

        xcable2=x06+[-0.05,0.05,0.05,-0.05];
        ycable2=[y05,y05,y06+0.9,y06+0.9];

        xcable3=x06+[-0.05,0.05,0.05,-0.05];
        ycable3=[-6.0,-6.0,y06-0.9,y06-0.9];

        xcable4=[9.0,9.0,x06,x06];
        ycable4=-6.0+[0.1,-0.1,-0.1,0.1];

        xcable5=[9.0,9.0,x01+1.2,x01+1.2];
        ycable5=y01+[0.1,-0.1,-0.1,0.1];

        xcable6=[x03+1.2,x03+1.2,x01,x01];
        ycable6=y01+[0.1,-0.1,-0.1,0.1];

        xcable7=[x05+1.2,x05+1.2,x03,x03];
        ycable7=y01+[0.1,-0.1,-0.1,0.1];

        xcable8=x02+[-0.05,0.05,0.05,-0.05];
        ycable8=[y05,y05,y02+1.6,y02+1.6];

        xcable9=x02+[-0.05,0.05,0.05,-0.05];
        ycable9=[-6.0,-6.0,y02,y02];

        xcable10=x02+[-0.05,0.05,0.05,-0.05];
        ycable10=[y05,y05,y04,y04];

        xcable11=x02+[-0.05,0.05,0.05,-0.05]-5.0;
        ycable11=[y05,y05,y04,y04];

        xcable12=[x02-5.05,x02-5.05,x04,x04];
        ycable12=y04+[0.1,-0.1,-0.1,0.1];

        xcable13=[x02+0.05,x02+0.05,x04+1.2,x04+1.2];
        ycable13=y04+[0.1,-0.1,-0.1,0.1];

        xcable14=[x02-5.05,x02-5.05,x07-0.25,x07-0.25];
        ycable14=y07+[0.1,-0.1,-0.1,0.1];

        xcable15=[x02+0.05,x02+0.05,x07+0.132,x07+0.132];
        ycable15=y07+[0.1,-0.1,-0.1,0.1];

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_51,yres_51,[1.0,1.0,1.0],...
xres_52,yres_52,[0.0,0.0,0.0],...
xres_31,yres_31,[1.0,1.0,1.0],...
xres_32,yres_32,[0.0,0.0,0.0],...
xres_41,yres_41,[1.0,1.0,1.0],...
xres_42,yres_42,[0.0,0.0,0.0],...
xres_11,yres_11,[1.0,1.0,1.0],...
xres_12,yres_12,[0.0,0.0,0.0],...
xres_21,yres_21,[1.0,1.0,1.0],...
xres_22,yres_22,[0.0,0.0,0.0],...
xI1_1,yI1_1,[0.0,0.0,0.0],...
xI1_2,yI1_2,[1.0,1.0,1.0],...
xI1_3,yI1_3,[0.0,0.0,0.0],...
xV1_1,yV1_1,[0.0,0.0,0.0],...
xV1_2,yV1_2,[0.0,0.0,0.0],...

```



```

xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
xcable10,ycable10,[0.8,0.6,0.2],...
xcable11,ycable11,[0.8,0.6,0.2],...
xcable12,ycable12,[0.8,0.6,0.2],...
xcable13,ycable13,[0.8,0.6,0.2],...
xcable14,ycable14,[0.8,0.6,0.2],...
xcable15,ycable15,[0.8,0.6,0.2],...
    'LineStyle','None')

text(-11,11,'Οι αντιστάσεις R_{3}, R_{4} είναι παράλληλες με την πηγή τάσης και άρα απαλείφονται. Η αντίσταση
    R_{5} είναι σε σειρά με την ')
text(-11,10,'πηγή ρεύματος και άρα απαλείφεται επίσης. Βραχυκυκλώνοντας την πηγή τάσης και ανοικτοκυκλώνοντας
    την πηγή ρεύματος')
text(-11,9,'προκύπτει εύκολα ότι R_{T}=R_{1}+R_{2}=')
text(-4.5,9.2,nRT)
text(-4.0,9.2,'Ohm. Θα έχουμε τώρα το παρακάτω ισοδύναμο κύκλωμα:')

text(x01+0.5,y01+1.0,'R_1','Color',[0.9,0.2,0.0])
text(x02+0.5,y02+0.8,'R_2','Color',[0.9,0.2,0.0])
text(x03+0.5,y03-1.0,'R_3','Color',[0.9,0.2,0.0])
text(x05+0.5,y05+1.0,'R_5','Color',[0.9,0.2,0.0])
text(x04+0.5,y04+1.0,'R_4','Color',[0.9,0.2,0.0])
text(x06+1.0,y06,'J_1','Color',[0.7,0.0,0.7])
text(x07+0.5,y07+0.9,'V_1','Color',[0.0,0.2,0.9])
text(9.5,y01,'a','Color',[0.9,0.0,0.0])
text(9.5,-6.0,'b','Color',[0.9,0.0,0.0])

axis([-12,12,-12,12])
axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

% --- Executes on button press in pushbutton2.
function pushbutton2_Callback(hObject, eventdata, handles)
% hObject handle to pushbutton2 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
global R1;
global R2;
global R3;
global R4;
global R5;
global V1;
global J1;

global snmeio;

snmeio=snmeio+1;

if (snmeio==4)
snmeio=1;
end
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
RT=R1+R2;
nRT=num2str(0.01*round(100*RT));
V2=J1*R2;
nV2=num2str(0.01*round(100*V2));
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
if (snmeio==1)
axes(handles.axes1);
cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,8.5,8.5];

```

```

x05=-7;
y05=2;
th5=0;

xres_51=x05+[0.40*sin(th5),0.40*sin(th5)+1.2*cos(th5),...
-0.40*sin(th5)+1.2*cos(th5),-0.40*sin(th5)];
yres_51=y05+[-0.40*cos(th5),-0.40*cos(th5)+1.2*sin(th5),...
0.40*cos(th5)+1.2*sin(th5),0.40*cos(th5)];

xres_52=x05+[-0.05*sin(th5),-0.05*sin(th5)+0.25*cos(th5),...
-0.40*sin(th5)+0.3*cos(th5),...
0.25*sin(th5)+0.45*cos(th5),...
-0.40*sin(th5)+0.6*cos(th5),...
0.25*sin(th5)+0.75*cos(th5),...
-0.40*sin(th5)+0.9*cos(th5),...
-0.05*sin(th5)+0.95*cos(th5),...
-0.05*sin(th5)+1.2*cos(th5),...
0.05*sin(th5)+1.2*cos(th5),...
0.05*sin(th5)+0.95*cos(th5),...
-0.25*sin(th5)+0.9*cos(th5),...
0.40*sin(th5)+0.75*cos(th5),...
-0.25*sin(th5)+0.6*cos(th5),...
0.40*sin(th5)+0.45*cos(th5),...
-0.25*sin(th5)+0.3*cos(th5),...
0.05*sin(th5)+0.25*cos(th5),...
0.05*sin(th5)];
yres_52=y05+[0.05*cos(th5),0.05*cos(th5)+0.25*sin(th5),...
0.40*cos(th5)+0.3*sin(th5),...
-0.25*cos(th5)+0.45*sin(th5),...
0.40*cos(th5)+0.6*sin(th5),...
-0.250*cos(th5)+0.75*sin(th5),...
0.40*cos(th5)+0.9*sin(th5),...
0.05*cos(th5)+0.95*sin(th5),...
0.05*cos(th5)+1.2*sin(th5),...
-0.05*cos(th5)+1.2*sin(th5),...
-0.05*cos(th5)+0.95*sin(th5),...
0.25*cos(th5)+0.9*sin(th5),...
-0.40*cos(th5)+0.75*sin(th5),...
0.25*cos(th5)+0.6*sin(th5),...
-0.40*cos(th5)+0.45*sin(th5),...
0.25*cos(th5)+0.3*sin(th5),...
-0.05*cos(th5)+0.25*sin(th5),...
-0.05*cos(th5)];

x03=-2;
y03=2;
th3=0;

xres_31=x03+[0.40*sin(th3),0.40*sin(th3)+1.2*cos(th3),...
-0.40*sin(th3)+1.2*cos(th3),-0.40*sin(th3)];
yres_31=y03+[-0.40*cos(th3),-0.40*cos(th3)+1.2*sin(th3),...
0.40*cos(th3)+1.2*sin(th3),0.40*cos(th3)];

xres_32=x03+[-0.05*sin(th3),-0.05*sin(th3)+0.25*cos(th3),...
-0.40*sin(th3)+0.3*cos(th3),...
0.25*sin(th3)+0.45*cos(th3),...
-0.40*sin(th3)+0.6*cos(th3),...
0.25*sin(th3)+0.75*cos(th3),...
-0.40*sin(th3)+0.9*cos(th3),...
-0.05*sin(th3)+0.95*cos(th3),...
-0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+0.95*cos(th3),...
-0.25*sin(th3)+0.9*cos(th3),...
0.40*sin(th3)+0.75*cos(th3),...
-0.25*sin(th3)+0.6*cos(th3),...
0.40*sin(th3)+0.45*cos(th3),...
-0.25*sin(th3)+0.3*cos(th3),...
0.05*sin(th3)+0.25*cos(th3),...
0.05*sin(th3)];
yres_32=y03+[0.05*cos(th3),0.05*cos(th3)+0.25*sin(th3),...
0.40*cos(th3)+0.3*sin(th3),...
-0.25*cos(th3)+0.45*sin(th3),...
0.40*cos(th3)+0.6*sin(th3),...
-0.250*cos(th3)+0.75*sin(th3),...
0.40*cos(th3)+0.9*sin(th3),...
0.05*cos(th3)+0.95*sin(th3),...
0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+0.95*sin(th3),...
0.25*cos(th3)+0.9*sin(th3),...

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-0.40*cos(th3)+0.75*sin(th3),...
0.25*cos(th3)+0.6*sin(th3),...
-0.40*cos(th3)+0.45*sin(th3),...
0.25*cos(th3)+0.3*sin(th3),...
-0.05*cos(th3)+0.25*sin(th3),...
-0.05*cos(th3)];

x04=-2;
y04=7;
th4=0;

xres_41=x04+[0.40*sin(th4),0.40*sin(th4)+1.2*cos(th4),...
-0.40*sin(th4)+1.2*cos(th4),-0.40*sin(th4)];
yres_41=y04+[-0.40*cos(th4),-0.40*cos(th4)+1.2*sin(th4),...
0.40*cos(th4)+1.2*sin(th4),0.40*cos(th4)];

xres_42=x04+[-0.05*sin(th4),-0.05*sin(th4)+0.25*cos(th4),...
-0.40*sin(th4)+0.3*cos(th4),...
0.25*sin(th4)+0.45*cos(th4),...
-0.40*sin(th4)+0.6*cos(th4),...
0.25*sin(th4)+0.75*cos(th4),...
-0.40*sin(th4)+0.9*cos(th4),...
-0.05*sin(th4)+0.95*cos(th4),...
-0.05*sin(th4)+1.2*cos(th4),...
0.05*sin(th4)+1.2*cos(th4),...
0.05*sin(th4)+0.95*cos(th4),...
-0.25*sin(th4)+0.9*cos(th4),...
0.40*sin(th4)+0.75*cos(th4),...
-0.25*sin(th4)+0.6*cos(th4),...
0.40*sin(th4)+0.45*cos(th4),...
-0.25*sin(th4)+0.3*cos(th4),...
0.05*sin(th4)+0.25*cos(th4),...
0.05*sin(th4)];
yres_42=y04+[0.05*cos(th4),0.05*cos(th4)+0.25*sin(th4),...
0.40*cos(th4)+0.3*sin(th4),...
-0.25*cos(th4)+0.45*sin(th4),...
0.40*cos(th4)+0.6*sin(th4),...
-0.250*cos(th4)+0.75*sin(th4),...
0.40*cos(th4)+0.9*sin(th4),...
0.05*cos(th4)+0.95*sin(th4),...
0.05*cos(th4)+1.2*sin(th4),...
-0.05*cos(th4)+1.2*sin(th4),...
-0.05*cos(th4)+0.95*sin(th4),...
0.25*cos(th4)+0.9*sin(th4),...
-0.40*cos(th4)+0.75*sin(th4),...
0.25*cos(th4)+0.6*sin(th4),...
-0.40*cos(th4)+0.45*sin(th4),...
0.25*cos(th4)+0.3*sin(th4),...
-0.05*cos(th4)+0.25*sin(th4),...
-0.05*cos(th4)];

x01=3;
y01=2;
th1=0;

xres_11=x01+[0.40*sin(th1),0.40*sin(th1)+1.2*cos(th1),...
-0.40*sin(th1)+1.2*cos(th1),-0.40*sin(th1)];
yres_11=y01+[-0.40*cos(th1),-0.40*cos(th1)+1.2*sin(th1),...
0.40*cos(th1)+1.2*sin(th1),0.40*cos(th1)];

xres_12=x01+[-0.05*sin(th1),-0.05*sin(th1)+0.25*cos(th1),...
-0.40*sin(th1)+0.3*cos(th1),...
0.25*sin(th1)+0.45*cos(th1),...
-0.40*sin(th1)+0.6*cos(th1),...
0.25*sin(th1)+0.75*cos(th1),...
-0.40*sin(th1)+0.9*cos(th1),...
-0.05*sin(th1)+0.95*cos(th1),...
-0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+0.95*cos(th1),...
-0.25*sin(th1)+0.9*cos(th1),...
0.40*sin(th1)+0.75*cos(th1),...
-0.25*sin(th1)+0.6*cos(th1),...
0.40*sin(th1)+0.45*cos(th1),...
-0.25*sin(th1)+0.3*cos(th1),...
0.05*sin(th1)+0.25*cos(th1),...
0.05*sin(th1)];
yres_12=y01+[0.05*cos(th1),0.05*cos(th1)+0.25*sin(th1),...
0.40*cos(th1)+0.3*sin(th1),...
-0.25*cos(th1)+0.45*sin(th1),...

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0.40*cos(th1)+0.6*sin(th1),...
-0.250*cos(th1)+0.75*sin(th1),...
0.40*cos(th1)+0.9*sin(th1),...
0.05*cos(th1)+0.95*sin(th1),...
0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+0.95*sin(th1),...
0.25*cos(th1)+0.9*sin(th1),...
-0.40*cos(th1)+0.75*sin(th1),...
0.25*cos(th1)+0.6*sin(th1),...
-0.40*cos(th1)+0.45*sin(th1),...
0.25*cos(th1)+0.3*sin(th1),...
-0.05*cos(th1)+0.25*sin(th1),...
-0.05*cos(th1)];

x02=1.0;
y02=-3;
th2=pi/2;

xres_21=x02+[0.25*sin(th2),0.25*sin(th2)+1.6*cos(th2),...
-0.25*sin(th2)+1.6*cos(th2),-0.25*sin(th2)];
yres_21=y02+[-0.25*cos(th2),-0.25*cos(th2)+1.6*sin(th2),...
0.25*cos(th2)+1.6*sin(th2),0.25*cos(th2)];

xres_22=x02+[-0.03*sin(th2),-0.03*sin(th2)+0.33*cos(th2),...
-0.25*sin(th2)+0.4*cos(th2),...
0.10*sin(th2)+0.6*cos(th2),...
-0.25*sin(th2)+0.8*cos(th2),...
0.10*sin(th2)+1.0*cos(th2),...
-0.25*sin(th2)+1.2*cos(th2),...
-0.03*sin(th2)+1.27*cos(th2),...
-0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.27*cos(th2),...
-0.10*sin(th2)+1.2*cos(th2),...
0.25*sin(th2)+1.0*cos(th2),...
-0.10*sin(th2)+0.8*cos(th2),...
0.03*sin(th2)+0.33*cos(th2),...
0.03*sin(th2)];
yres_22=y02+[0.03*cos(th2),0.03*cos(th2)+0.33*sin(th2),...
0.25*cos(th2)+0.4*sin(th2),...
-0.10*cos(th2)+0.6*sin(th2),...
0.25*cos(th2)+0.8*sin(th2),...
-0.10*cos(th2)+1.0*sin(th2),...
0.25*cos(th2)+1.2*sin(th2),...
0.03*cos(th2)+1.27*sin(th2),...
0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.27*sin(th2),...
0.10*cos(th2)+1.2*sin(th2),...
-0.25*cos(th2)+1.0*sin(th2),...
0.10*cos(th2)+0.8*sin(th2),...
-0.25*cos(th2)+0.6*sin(th2),...
0.10*cos(th2)+0.4*sin(th2),...
-0.03*cos(th2)+0.33*sin(th2),...
-0.03*cos(th2)];

x06=-9.0;
y06=-2.5;
phi6=0:0.01:2*pi;

xI1_1=x06+0.6*cos(phi6);
yI1_1=y06+0.9*sin(phi6);

xI1_2=x06+0.55*cos(phi6);
yI1_2=y06+0.85*sin(phi6);

xI1_3=x06+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI1_3=y06+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

x07=-1.5;
y07=4.5;

xV1_1=x07+[-0.032,0.032,0.032,-0.032]+0.1;
yV1_1=y07+[-1.5,-1.5,1.5,1.5];

xV1_2=x07+[-0.05,0.05,0.05,-0.05]-0.2;
yV1_2=y07+[-0.75,-0.75,0.75,0.75];

```

```

        xcable1=[x05,x05,x06,x06];
        ycable1=y05+[0.1,-0.1,-0.1,0.1];

xcable2=x06+[-0.05,0.05,0.05,-0.05];
ycable2=[y05,y05,y06+0.9,y06+0.9];

xcable3=x06+[-0.05,0.05,0.05,-0.05];
ycable3=[-6.0,-6.0,y06-0.9,y06-0.9];

        xcable4=[9.0,9.0,x06,x06];
        ycable4=-6.0+[0.1,-0.1,-0.1,0.1];

xcable5=[9.0,9.0,x01+1.2,x01+1.2];
ycable5=y01+[0.1,-0.1,-0.1,0.1];

xcable6=[x03+1.2,x03+1.2,x01,x01];
ycable6=y01+[0.1,-0.1,-0.1,0.1];

xcable7=[x05+1.2,x05+1.2,x03,x03];
ycable7=y01+[0.1,-0.1,-0.1,0.1];

xcable8=x02+[-0.05,0.05,0.05,-0.05];
ycable8=[y05,y05,y02+1.6,y02+1.6];

xcable9=x02+[-0.05,0.05,0.05,-0.05];
ycable9=[-6.0,-6.0,y02,y02];

xcable10=x02+[-0.05,0.05,0.05,-0.05];
ycable10=[y05,y05,y04,y04];

xcable11=x02+[-0.05,0.05,0.05,-0.05]-5.0;
ycable11=[y05,y05,y04,y04];

xcable12=[x02-5.05,x02-5.05,x04,x04];
ycable12=y04+[0.1,-0.1,-0.1,0.1];

xcable13=[x02+0.05,x02+0.05,x04+1.2,x04+1.2];
ycable13=y04+[0.1,-0.1,-0.1,0.1];

xcable14=[x02-5.05,x02-5.05,x07-0.25,x07-0.25];
ycable14=y07+[0.1,-0.1,-0.1,0.1];

xcable15=[x02+0.05,x02+0.05,x07+0.132,x07+0.132];
ycable15=y07+[0.1,-0.1,-0.1,0.1];

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_51,yres_51,[1.0,1.0,1.0],...
xres_52,yres_52,[0.0,0.0,0.0],...
xres_31,yres_31,[1.0,1.0,1.0],...
xres_32,yres_32,[0.0,0.0,0.0],...
xres_41,yres_41,[1.0,1.0,1.0],...
xres_42,yres_42,[0.0,0.0,0.0],...
xres_11,yres_11,[1.0,1.0,1.0],...
xres_12,yres_12,[0.0,0.0,0.0],...
xres_21,yres_21,[1.0,1.0,1.0],...
xres_22,yres_22,[0.0,0.0,0.0],...
xi1_1,yi1_1,[0.0,0.0,0.0],...
xi1_2,yi1_2,[1.0,1.0,1.0],...
xi1_3,yi1_3,[0.0,0.0,0.0],...
xv1_1,yv1_1,[0.0,0.0,0.0],...
xv1_2,yv1_2,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
xcable10,ycable10,[0.8,0.6,0.2],...
xcable11,ycable11,[0.8,0.6,0.2],...
xcable12,ycable12,[0.8,0.6,0.2],...
xcable13,ycable13,[0.8,0.6,0.2],...
xcable14,ycable14,[0.8,0.6,0.2],...
xcable15,ycable15,[0.8,0.6,0.2],...

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                                'LineStyle','None')
text(-11,11,'Οι αντιστάσεις R_{3}, R_{4} είναι παράλληλες με την πηγή τάσης και άρα απαλείφονται. Η αντίσταση
                                R_{5} είναι σε σειρά με την ')
text(-11,10,'πηγή ρεύματος και άρα απαλείφεται επίσης. Βραχυκυκλώνοντας την πηγή τάσης και ανοικτοκυκλώνοντας
                                την πηγή ρεύματος')
text(-11,9,'προκύπτει εύκολα ότι R_{T}=R_{1}+R_{2}=')
text(-4.5,9.2,nRT)
text(-4.0,9.2,'Ohm. Θα έχουμε τώρα το παρακάτω ισοδύναμο κύκλωμα:')

text(x01+0.5,y01+1.0,'R_1','Color',[0.9,0.2,0.0])
text(x02+0.5,y02+0.8,'R_2','Color',[0.9,0.2,0.0])
text(x03+0.5,y03-1.0,'R_3','Color',[0.9,0.2,0.0])
text(x05+0.5,y05+1.0,'R_5','Color',[0.9,0.2,0.0])
text(x04+0.5,y04+1.0,'R_4','Color',[0.9,0.2,0.0])
text(x06+1.0,y06,'J_1','Color',[0.7,0.0,0.7])
text(x07+0.5,y07+0.9,'V_1','Color',[0.0,0.2,0.9])
text(9.5,y01,'a','Color',[0.9,0.0,0.0])
text(9.5,-6.0,'b','Color',[0.9,0.0,0.0])

axis([-12,12,-12,12])
axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
elseif (snmeio==2)
axes(handles.axes1);
cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,8.5,8.5];

x05=-7;
y05=2;
th5=0;

x03=-2;
y03=2;
th3=0;

x04=-2;
y04=7;
th4=0;

x01=3;
y01=2;
th1=0;

xres_11=x01+[0.40*sin(th1),0.40*sin(th1)+1.2*cos(th1),...
-0.40*sin(th1)+1.2*cos(th1),-0.40*sin(th1)];
yres_11=y01+[-0.40*cos(th1),-0.40*cos(th1)+1.2*sin(th1),...
0.40*cos(th1)+1.2*sin(th1),0.40*cos(th1)];

xres_12=x01+[-0.05*sin(th1),-0.05*sin(th1)+0.25*cos(th1),...
-0.40*sin(th1)+0.3*cos(th1),...
0.25*sin(th1)+0.45*cos(th1),...
-0.40*sin(th1)+0.6*cos(th1),...
0.25*sin(th1)+0.75*cos(th1),...
-0.40*sin(th1)+0.9*cos(th1),...
-0.05*sin(th1)+0.95*cos(th1),...
-0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+0.95*cos(th1),...
-0.25*sin(th1)+0.9*cos(th1),...
0.40*sin(th1)+0.75*cos(th1),...
-0.25*sin(th1)+0.6*cos(th1),...
0.40*sin(th1)+0.45*cos(th1),...
-0.25*sin(th1)+0.3*cos(th1),...
0.05*sin(th1)+0.25*cos(th1),...
0.05*sin(th1)];
yres_12=y01+[0.05*cos(th1),0.05*cos(th1)+0.25*sin(th1),...
0.40*cos(th1)+0.3*sin(th1),...
-0.25*cos(th1)+0.45*sin(th1),...
0.40*cos(th1)+0.6*sin(th1),...
-0.25*cos(th1)+0.75*sin(th1),...
0.40*cos(th1)+0.9*sin(th1),...
0.05*cos(th1)+0.95*sin(th1),...
0.05*cos(th1)+1.2*sin(th1),...

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-0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+0.95*sin(th1),...
0.25*cos(th1)+0.9*sin(th1),...
-0.40*cos(th1)+0.75*sin(th1),...
0.25*cos(th1)+0.6*sin(th1),...
-0.40*cos(th1)+0.45*sin(th1),...
0.25*cos(th1)+0.3*sin(th1),...
-0.05*cos(th1)+0.25*sin(th1),...
-0.05*cos(th1)];

x02=1.0;
y02=-3;
th2=pi/2;

xres_21=x02+[0.25*sin(th2),0.25*sin(th2)+1.6*cos(th2),...
-0.25*sin(th2)+1.6*cos(th2),-0.25*sin(th2)];
yres_21=y02+[-0.25*cos(th2),-0.25*cos(th2)+1.6*sin(th2),...
0.25*cos(th2)+1.6*sin(th2),0.25*cos(th2)];

xres_22=x02+[-0.03*sin(th2),-0.03*sin(th2)+0.33*cos(th2),...
-0.25*sin(th2)+0.4*cos(th2),...
0.10*sin(th2)+0.6*cos(th2),...
-0.25*sin(th2)+0.8*cos(th2),...
0.10*sin(th2)+1.0*cos(th2),...
-0.25*sin(th2)+1.2*cos(th2),...
-0.03*sin(th2)+1.27*cos(th2),...
-0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.27*cos(th2),...
-0.10*sin(th2)+1.2*cos(th2),...
0.25*sin(th2)+1.0*cos(th2),...
-0.10*sin(th2)+0.8*cos(th2),...
0.25*sin(th2)+0.6*cos(th2),...
-0.10*sin(th2)+0.4*cos(th2),...
0.03*sin(th2)+0.33*cos(th2),...
0.03*sin(th2)];
yres_22=y02+[0.03*cos(th2),0.03*cos(th2)+0.33*sin(th2),...
0.25*cos(th2)+0.4*sin(th2),...
-0.10*cos(th2)+0.6*sin(th2),...
0.25*cos(th2)+0.8*sin(th2),...
-0.10*cos(th2)+1.0*sin(th2),...
0.25*cos(th2)+1.2*sin(th2),...
0.03*cos(th2)+1.27*sin(th2),...
0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.27*sin(th2),...
0.10*cos(th2)+1.2*sin(th2),...
-0.25*cos(th2)+1.0*sin(th2),...
0.10*cos(th2)+0.8*sin(th2),...
-0.25*cos(th2)+0.6*sin(th2),...
0.10*cos(th2)+0.4*sin(th2),...
-0.03*cos(th2)+0.33*sin(th2),...
-0.03*cos(th2)];

x06=-9.0;
y06=-3.5;
phi6=0:0.01:2*pi;

xI1_1=x06+0.6*cos(phi6);
yI1_1=y06+0.9*sin(phi6);

xI1_2=x06+0.55*cos(phi6);
yI1_2=y06+0.85*sin(phi6);

xI1_3=x06+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI1_3=y06+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

x07=-9.0;
y07=-0.5;

xV1_1=x07+[-1.0,1.0,1.0,-1.0];
yV1_1=y07+[-0.05,-0.05,0.05,0.05]+0.3;

xV1_2=x07+[-0.4,0.4,0.4,-0.4];
yV1_2=y07+[-0.1,-0.1,0.1,0.1]-0.1;

xcable1=[x05+1.2,x05+1.2,x06,x06];
ycable1=y05+[0.1,-0.1,-0.1,0.1];

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```

xcable2=x06+[-0.05,0.05,0.05,-0.05];
ycable2=[y05,y05,y07+0.35,y07+0.35];

xcable2_1=x06+[-0.05,0.05,0.05,-0.05];
ycable2_1=[y07-0.2,y07-0.2,y06+0.9,y06+0.9];

xcable3=x06+[-0.05,0.05,0.05,-0.05];
ycable3=[-6.0,-6.0,y06-0.9,y06-0.9];

xcable4=[9.0,9.0,x06,x06];
ycable4=-6.0+[0.1,-0.1,-0.1,0.1];

xcable5=[9.0,9.0,x01+1.2,x01+1.2];
ycable5=y01+[0.1,-0.1,-0.1,0.1];

xcable6=[x03,x03,x01,x01];
ycable6=y01+[0.1,-0.1,-0.1,0.1];

xcable7=[x05+1.2,x05+1.2,x03,x03];
ycable7=y01+[0.1,-0.1,-0.1,0.1];

xcable8=x02+[-0.05,0.05,0.05,-0.05];
ycable8=[y05,y05,y02+1.6,y02+1.6];

xcable9=x02+[-0.05,0.05,0.05,-0.05];
ycable9=[-6.0,-6.0,y02,y02];

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_11,yres_11,[1.0,1.0,1.0],...
xres_12,yres_12,[0.0,0.0,0.0],...
xres_21,yres_21,[1.0,1.0,1.0],...
xres_22,yres_22,[0.0,0.0,0.0],...
xI1_1,yI1_1,[0.0,0.0,0.0],...
xI1_2,yI1_2,[1.0,1.0,1.0],...
xI1_3,yI1_3,[0.0,0.0,0.0],...
xV1_1,yV1_1,[0.0,0.0,0.0],...
xV1_2,yV1_2,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable2_1,ycable2_1,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
'Linestyle','None')

text(-11,11,'Το ισοδύναμο κατά Norton από τα άκρα c,d περιέχει μόνον την πηγή ρεύματος  $J_{11}$ . Μετασχηματίζοντας
στο ισοδύναμο κατά Thevenin ')
text(-11,10,'έχουμε')

text(x01+0.5,y01+1.0,'R_1','Color',[0.9,0.2,0.0])
text(x02+0.5,y02+0.8,'R_2','Color',[0.9,0.2,0.0])
text(x06+1.0,y06,'J_1','Color',[0.7,0.0,0.7])
text(x07+0.5,y07+0.9,'V_1','Color',[0.0,0.2,0.9])
text(9.5,y01,'a','Color',[0.9,0.0,0.0])
text(9.5,-6.0,'b','Color',[0.9,0.0,0.0])
text(x02,y01+1.0,'c','Color',[0.9,0.0,0.0])
text(x02,-7.0,'d','Color',[0.9,0.0,0.0])

axis([-12,12,-12,12])
axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
elseif (snmeio==3)
axes(handles.axes1);
cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,8.5,8.5];

```



```

x05=-7;
y05=2;
th5=0;

x03=-2;
y03=2;
th3=0;

x04=-2;
y04=7;
th4=0;

x01=3;
y01=2;
th1=0;

xres_11=x01+[0.40*sin(th1),0.40*sin(th1)+1.2*cos(th1),...
-0.40*sin(th1)+1.2*cos(th1),-0.40*sin(th1)];
yres_11=y01+[-0.40*cos(th1),-0.40*cos(th1)+1.2*sin(th1),...
0.40*cos(th1)+1.2*sin(th1),0.40*cos(th1)];

xres_12=x01+[-0.05*sin(th1),-0.05*sin(th1)+0.25*cos(th1),...
-0.40*sin(th1)+0.3*cos(th1),...
0.25*sin(th1)+0.45*cos(th1),...
-0.40*sin(th1)+0.6*cos(th1),...
0.25*sin(th1)+0.75*cos(th1),...
-0.40*sin(th1)+0.9*cos(th1),...
-0.05*sin(th1)+0.95*cos(th1),...
-0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+0.95*cos(th1),...
-0.25*sin(th1)+0.9*cos(th1),...
0.40*sin(th1)+0.75*cos(th1),...
-0.25*sin(th1)+0.6*cos(th1),...
0.40*sin(th1)+0.45*cos(th1),...
-0.25*sin(th1)+0.3*cos(th1),...
0.05*sin(th1)+0.25*cos(th1),...
0.05*sin(th1)];
yres_12=y01+[0.05*cos(th1),0.05*cos(th1)+0.25*sin(th1),...
0.40*cos(th1)+0.3*sin(th1),...
-0.25*cos(th1)+0.45*sin(th1),...
0.40*cos(th1)+0.6*sin(th1),...
-0.25*cos(th1)+0.75*sin(th1),...
0.40*cos(th1)+0.9*sin(th1),...
0.05*cos(th1)+0.95*sin(th1),...
0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+0.95*sin(th1),...
0.25*cos(th1)+0.9*sin(th1),...
-0.40*cos(th1)+0.75*sin(th1),...
0.25*cos(th1)+0.6*sin(th1),...
-0.40*cos(th1)+0.45*sin(th1),...
0.25*cos(th1)+0.3*sin(th1),...
-0.05*cos(th1)+0.25*sin(th1),...
-0.05*cos(th1)];

x02=-3;
y02=2;
th2=0;

xres_21=x02+[0.40*sin(th2),0.40*sin(th2)+1.2*cos(th2),...
-0.40*sin(th2)+1.2*cos(th2),-0.40*sin(th2)];
yres_21=y02+[-0.40*cos(th2),-0.40*cos(th2)+1.2*sin(th2),...
0.40*cos(th2)+1.2*sin(th2),0.40*cos(th2)];

xres_22=x02+[-0.05*sin(th2),-0.05*sin(th2)+0.25*cos(th2),...
-0.40*sin(th2)+0.3*cos(th2),...
0.25*sin(th2)+0.45*cos(th2),...
-0.40*sin(th2)+0.6*cos(th2),...
0.25*sin(th2)+0.75*cos(th2),...
-0.40*sin(th2)+0.9*cos(th2),...
-0.05*sin(th2)+0.95*cos(th2),...
-0.05*sin(th2)+1.2*cos(th2),...
0.05*sin(th2)+1.2*cos(th2),...
0.05*sin(th2)+0.95*cos(th2),...
-0.25*sin(th2)+0.9*cos(th2),...
0.40*sin(th2)+0.75*cos(th2),...
-0.25*sin(th2)+0.6*cos(th2),...
0.40*sin(th2)+0.45*cos(th2),...
-0.25*sin(th2)+0.3*cos(th2),...
-0.25*sin(th2)+0.3*cos(th2),...

```

```

0.05*sin(th2)+0.25*cos(th2),...
0.05*sin(th2)];
yres_22=y02+[0.05*cos(th2),0.05*cos(th2)+0.25*sin(th2),...
0.40*cos(th2)+0.3*sin(th2),...
-0.25*cos(th2)+0.45*sin(th2),...
0.40*cos(th2)+0.6*sin(th2),...
-0.250*cos(th2)+0.75*sin(th2),...
0.40*cos(th2)+0.9*sin(th2),...
0.05*cos(th2)+0.95*sin(th2),...
0.05*cos(th2)+1.2*sin(th2),...
-0.05*cos(th2)+1.2*sin(th2),...
-0.05*cos(th2)+0.95*sin(th2),...
0.25*cos(th2)+0.9*sin(th2),...
-0.40*cos(th2)+0.75*sin(th2),...
0.25*cos(th2)+0.6*sin(th2),...
-0.40*cos(th2)+0.45*sin(th2),...
0.25*cos(th2)+0.3*sin(th2),...
-0.05*cos(th2)+0.25*sin(th2),...
-0.05*cos(th2)];

x06=-9.0;
y06=-3.5;
phi6=0:0.01:2*pi;

x07=-9.0;
y07=-1.5;

xv1_1=x07+[-1.0,1.0,1.0,-1.0];
yv1_1=y07+[-0.05,-0.05,0.05,0.05]+0.3;

xv1_2=x07+[-0.4,0.4,0.4,-0.4];
yv1_2=y07+[-0.1,-0.1,0.1,0.1]-0.1;

xcable1=[x05+1.2,x05+1.2,x06,x06];
ycable1=y05+[0.1,-0.1,-0.1,0.1];

xcable2=x06+[-0.05,0.05,0.05,-0.05];
ycable2=[y05,y05,y07+0.35,y07+0.35];

xcable2_1=x06+[-0.05,0.05,0.05,-0.05];
ycable2_1=[y07-0.2,y07-0.2,y06+0.9,y06+0.9];

xcable3=x06+[-0.05,0.05,0.05,-0.05];
ycable3=[-6.0,-6.0,y06+0.9,y06+0.9];

xcable4=[9.0,9.0,x06,x06];
ycable4=-6.0+[0.1,-0.1,-0.1,0.1];

xcable5=[9.0,9.0,x01+1.2,x01+1.2];
ycable5=y01+[0.1,-0.1,-0.1,0.1];

xcable6=[x02+1.2,x02+1.2,x01,x01];
ycable6=y01+[0.1,-0.1,-0.1,0.1];

xcable7=[x05+1.2,x05+1.2,x02,x02];
ycable7=y01+[0.1,-0.1,-0.1,0.1];

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_11,yres_11,[1.0,1.0,1.0],...
xres_12,yres_12,[0.0,0.0,0.0],...
xres_21,yres_21,[1.0,1.0,1.0],...
xres_22,yres_22,[0.0,0.0,0.0],...
xv1_1,yv1_1,[0.0,0.0,0.0],...
xv1_2,yv1_2,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable2_1,ycable2_1,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
'Linestyle','None')
text(-11,11,'Apo V_{T}=V_{2}=J_{1}R_{2}=')
text(-7.5,11.2,nV2)
text(-6.8,11.2,'Volt.')
```

```

text(x01+0.5,y01+1.0,'R_1','Color',[0.9,0.2,0.0])
text(x02+0.5,y02+0.8,'R_2','Color',[0.9,0.2,0.0])
text(x07+0.5,y07+0.9,'V_2=J_1R_2','Color',[0.0,0.2,0.9])
text(9.5,y01,'a','Color',[0.9,0.0,0.0])
text(9.5,-6.0,'b','Color',[0.9,0.0,0.0])

axis([-12,12,-12,12])
axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

else
end

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

% --- Executes on button press in pushbutton3.
function pushbutton3_Callback(hObject, eventdata, handles)
% hObject handle to pushbutton3 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
global R1;
global R2;
global R3;
global R4;
global R5;
global V1;
global J1;

global snmeio;

snmeio=snmeio-1;

if (snmeio==0)
snmeio=3;
end

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
RT=R1+R2;
nRT=num2str(0.01*round(100*RT));
V2=J1*R2;
nV2=num2str(0.01*round(100*V2));
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
if (snmeio==1)
axes(handles.axes1);
cla

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_Tableau=[-11,-11,8.5,8.5];

x05=-7;
y05=2;
th5=0;

xres_51=x05+[0.40*sin(th5),0.40*sin(th5)+1.2*cos(th5),...
-0.40*sin(th5)+1.2*cos(th5),-0.40*sin(th5)];
yres_51=y05+[-0.40*cos(th5),-0.40*cos(th5)+1.2*sin(th5),...
0.40*cos(th5)+1.2*sin(th5),0.40*cos(th5)];

xres_52=x05+[-0.05*sin(th5),-0.05*sin(th5)+0.25*cos(th5),...
-0.40*sin(th5)+0.3*cos(th5),...
0.25*sin(th5)+0.45*cos(th5),...
-0.40*sin(th5)+0.6*cos(th5),...
0.25*sin(th5)+0.75*cos(th5),...
-0.40*sin(th5)+0.9*cos(th5),...
-0.05*sin(th5)+0.95*cos(th5),...
-0.05*sin(th5)+1.2*cos(th5),...
0.05*sin(th5)+1.2*cos(th5),...
0.05*sin(th5)+0.95*cos(th5),...
-0.25*sin(th5)+0.9*cos(th5),...
0.40*sin(th5)+0.75*cos(th5),...
-0.25*sin(th5)+0.6*cos(th5),...

```

```

0.40*sin(th5)+0.45*cos(th5),...
-0.25*sin(th5)+0.3*cos(th5),...
0.05*sin(th5)+0.25*cos(th5),...
0.05*sin(th5)];
yres_52=y05+[0.05*cos(th5),0.05*cos(th5)+0.25*sin(th5),...
0.40*cos(th5)+0.3*sin(th5),...
-0.25*cos(th5)+0.45*sin(th5),...
0.40*cos(th5)+0.6*sin(th5),...
-0.250*cos(th5)+0.75*sin(th5),...
0.40*cos(th5)+0.9*sin(th5),...
0.05*cos(th5)+0.95*sin(th5),...
0.05*cos(th5)+1.2*sin(th5),...
-0.05*cos(th5)+1.2*sin(th5),...
-0.05*cos(th5)+0.95*sin(th5),...
0.25*cos(th5)+0.9*sin(th5),...
-0.40*cos(th5)+0.75*sin(th5),...
0.25*cos(th5)+0.6*sin(th5),...
-0.40*cos(th5)+0.45*sin(th5),...
0.25*cos(th5)+0.3*sin(th5),...
-0.05*cos(th5)+0.25*sin(th5),...
-0.05*cos(th5)];

x03=-2;
y03=2;
th3=0;

xres_31=x03+[0.40*sin(th3),0.40*sin(th3)+1.2*cos(th3),...
-0.40*sin(th3)+1.2*cos(th3),-0.40*sin(th3)];
yres_31=y03+[-0.40*cos(th3),-0.40*cos(th3)+1.2*sin(th3),...
0.40*cos(th3)+1.2*sin(th3),0.40*cos(th3)];

xres_32=x03+[-0.05*sin(th3),-0.05*sin(th3)+0.25*cos(th3),...
-0.40*sin(th3)+0.3*cos(th3),...
0.25*sin(th3)+0.45*cos(th3),...
-0.40*sin(th3)+0.6*cos(th3),...
0.25*sin(th3)+0.75*cos(th3),...
-0.40*sin(th3)+0.9*cos(th3),...
-0.05*sin(th3)+0.95*cos(th3),...
-0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+0.95*cos(th3),...
-0.25*sin(th3)+0.9*cos(th3),...
0.40*sin(th3)+0.75*cos(th3),...
-0.25*sin(th3)+0.6*cos(th3),...
0.40*sin(th3)+0.45*cos(th3),...
-0.25*sin(th3)+0.3*cos(th3),...
0.05*sin(th3)+0.25*cos(th3),...
0.05*sin(th3)];
yres_32=y03+[0.05*cos(th3),0.05*cos(th3)+0.25*sin(th3),...
0.40*cos(th3)+0.3*sin(th3),...
-0.25*cos(th3)+0.45*sin(th3),...
0.40*cos(th3)+0.6*sin(th3),...
-0.250*cos(th3)+0.75*sin(th3),...
0.40*cos(th3)+0.9*sin(th3),...
0.05*cos(th3)+0.95*sin(th3),...
0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+0.95*sin(th3),...
0.25*cos(th3)+0.9*sin(th3),...
-0.40*cos(th3)+0.75*sin(th3),...
0.25*cos(th3)+0.6*sin(th3),...
-0.40*cos(th3)+0.45*sin(th3),...
0.25*cos(th3)+0.3*sin(th3),...
-0.05*cos(th3)+0.25*sin(th3),...
-0.05*cos(th3)];

x04=-2;
y04=7;
th4=0;

xres_41=x04+[0.40*sin(th4),0.40*sin(th4)+1.2*cos(th4),...
-0.40*sin(th4)+1.2*cos(th4),-0.40*sin(th4)];
yres_41=y04+[-0.40*cos(th4),-0.40*cos(th4)+1.2*sin(th4),...
0.40*cos(th4)+1.2*sin(th4),0.40*cos(th4)];

xres_42=x04+[-0.05*sin(th4),-0.05*sin(th4)+0.25*cos(th4),...
-0.40*sin(th4)+0.3*cos(th4),...
0.25*sin(th4)+0.45*cos(th4),...
-0.40*sin(th4)+0.6*cos(th4),...
0.25*sin(th4)+0.75*cos(th4),...

```

```

-0.40*sin(th4)+0.9*cos(th4),...
-0.05*sin(th4)+0.95*cos(th4),...
-0.05*sin(th4)+1.2*cos(th4),...
0.05*sin(th4)+1.2*cos(th4),...
0.05*sin(th4)+0.95*cos(th4),...
-0.25*sin(th4)+0.9*cos(th4),...
0.40*sin(th4)+0.75*cos(th4),...
-0.25*sin(th4)+0.6*cos(th4),...
0.40*sin(th4)+0.45*cos(th4),...
-0.25*sin(th4)+0.3*cos(th4),...
0.05*sin(th4)+0.25*cos(th4),...
0.05*sin(th4)];
yres_42=y04+[0.05*cos(th4),0.05*cos(th4)+0.25*sin(th4),...
0.40*cos(th4)+0.3*sin(th4),...
-0.25*cos(th4)+0.45*sin(th4),...
0.40*cos(th4)+0.6*sin(th4),...
-0.250*cos(th4)+0.75*sin(th4),...
0.40*cos(th4)+0.9*sin(th4),...
0.05*cos(th4)+0.95*sin(th4),...
0.05*cos(th4)+1.2*sin(th4),...
-0.05*cos(th4)+1.2*sin(th4),...
-0.05*cos(th4)+0.95*sin(th4),...
0.25*cos(th4)+0.9*sin(th4),...
-0.40*cos(th4)+0.75*sin(th4),...
0.25*cos(th4)+0.6*sin(th4),...
-0.40*cos(th4)+0.45*sin(th4),...
0.25*cos(th4)+0.3*sin(th4),...
-0.05*cos(th4)+0.25*sin(th4),...
-0.05*cos(th4)];

x01=3;
y01=2;
th1=0;

xres_11=x01+[0.40*sin(th1),0.40*sin(th1)+1.2*cos(th1),...
-0.40*sin(th1)+1.2*cos(th1),-0.40*sin(th1)];
yres_11=y01+[-0.40*cos(th1),-0.40*cos(th1)+1.2*sin(th1),...
0.40*cos(th1)+1.2*sin(th1),0.40*cos(th1)];

xres_12=x01+[-0.05*sin(th1),-0.05*sin(th1)+0.25*cos(th1),...
-0.40*sin(th1)+0.3*cos(th1),...
0.25*sin(th1)+0.45*cos(th1),...
-0.40*sin(th1)+0.6*cos(th1),...
0.25*sin(th1)+0.75*cos(th1),...
-0.40*sin(th1)+0.9*cos(th1),...
-0.05*sin(th1)+0.95*cos(th1),...
-0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+0.95*cos(th1),...
-0.25*sin(th1)+0.9*cos(th1),...
0.40*sin(th1)+0.75*cos(th1),...
-0.25*sin(th1)+0.6*cos(th1),...
0.40*sin(th1)+0.45*cos(th1),...
-0.25*sin(th1)+0.3*cos(th1),...
0.05*sin(th1)+0.25*cos(th1),...
0.05*sin(th1)];
yres_12=y01+[0.05*cos(th1),0.05*cos(th1)+0.25*sin(th1),...
0.40*cos(th1)+0.3*sin(th1),...
-0.25*cos(th1)+0.45*sin(th1),...
0.40*cos(th1)+0.6*sin(th1),...
-0.250*cos(th1)+0.75*sin(th1),...
0.40*cos(th1)+0.9*sin(th1),...
0.05*cos(th1)+0.95*sin(th1),...
0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+0.95*sin(th1),...
0.25*cos(th1)+0.9*sin(th1),...
-0.40*cos(th1)+0.75*sin(th1),...
0.25*cos(th1)+0.6*sin(th1),...
-0.40*cos(th1)+0.45*sin(th1),...
0.25*cos(th1)+0.3*sin(th1),...
-0.05*cos(th1)+0.25*sin(th1),...
-0.05*cos(th1)];

x02=1.0;
y02=-3;
th2=pi/2;

xres_21=x02+[0.25*sin(th2),0.25*sin(th2)+1.6*cos(th2),...
-0.25*sin(th2)+1.6*cos(th2),-0.25*sin(th2)];
yres_21=y02+[-0.25*cos(th2),-0.25*cos(th2)+1.6*sin(th2),...

```

```

0.25*cos(th2)+1.6*sin(th2),0.25*cos(th2)];

xres_22=x02+[-0.03*sin(th2),-0.03*sin(th2)+0.33*cos(th2),...
-0.25*sin(th2)+0.4*cos(th2),...
0.10*sin(th2)+0.6*cos(th2),...
-0.25*sin(th2)+0.8*cos(th2),...
0.10*sin(th2)+1.0*cos(th2),...
-0.25*sin(th2)+1.2*cos(th2),...
-0.03*sin(th2)+1.27*cos(th2),...
-0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.27*cos(th2),...
-0.10*sin(th2)+1.2*cos(th2),...
0.25*sin(th2)+1.0*cos(th2),...
-0.10*sin(th2)+0.8*cos(th2),...
0.25*sin(th2)+0.6*cos(th2),...
-0.10*sin(th2)+0.4*cos(th2),...
0.03*sin(th2)+0.33*cos(th2),...
0.03*sin(th2)];
yres_22=y02+[0.03*cos(th2),0.03*cos(th2)+0.33*sin(th2),...
0.25*cos(th2)+0.4*sin(th2),...
-0.10*cos(th2)+0.6*sin(th2),...
0.25*cos(th2)+0.8*sin(th2),...
-0.10*cos(th2)+1.0*sin(th2),...
0.25*cos(th2)+1.2*sin(th2),...
0.03*cos(th2)+1.27*sin(th2),...
0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.27*sin(th2),...
0.10*cos(th2)+1.2*sin(th2),...
-0.25*cos(th2)+1.0*sin(th2),...
0.10*cos(th2)+0.8*sin(th2),...
-0.25*cos(th2)+0.6*sin(th2),...
0.10*cos(th2)+0.4*sin(th2),...
-0.03*cos(th2)+0.33*sin(th2),...
-0.03*cos(th2)];

x06=-9.0;
y06=-2.5;
phi6=0:0.01:2*pi;

xI1_1=x06+0.6*cos(phi6);
yI1_1=y06+0.9*sin(phi6);

xI1_2=x06+0.55*cos(phi6);
yI1_2=y06+0.85*sin(phi6);

xI1_3=x06+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI1_3=y06+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

x07=-1.5;
y07=4.5;

xV1_1=x07+[-0.032,0.032,0.032,-0.032]+0.1;
yV1_1=y07+[-1.5,-1.5,1.5,1.5];

xV1_2=x07+[-0.05,0.05,0.05,-0.05]-0.2;
yV1_2=y07+[-0.75,-0.75,0.75,0.75];

xcable1=[x05,x05,x06,x06];
ycable1=[y05+0.1,-0.1,-0.1,0.1];

xcable2=x06+[-0.05,0.05,0.05,-0.05];
ycable2=[y05,y05,y06+0.9,y06+0.9];

xcable3=x06+[-0.05,0.05,0.05,-0.05];
ycable3=[-6.0,-6.0,y06-0.9,y06-0.9];

xcable4=[9.0,9.0,x06,x06];
ycable4=-6.0+[0.1,-0.1,-0.1,0.1];

xcable5=[9.0,9.0,x01+1.2,x01+1.2];
ycable5=y01+[0.1,-0.1,-0.1,0.1];

xcable6=[x03+1.2,x03+1.2,x01,x01];
ycable6=y01+[0.1,-0.1,-0.1,0.1];

xcable7=[x05+1.2,x05+1.2,x03,x03];
ycable7=y01+[0.1,-0.1,-0.1,0.1];

```

```

xcable8=x02+[-0.05,0.05,0.05,-0.05];
ycable8=[y05,y05,y02+1.6,y02+1.6];

xcable9=x02+[-0.05,0.05,0.05,-0.05];
ycable9=[-6.0,-6.0,y02,y02];

xcable10=x02+[-0.05,0.05,0.05,-0.05];
ycable10=[y05,y05,y04,y04];

xcable11=x02+[-0.05,0.05,0.05,-0.05]-5.0;
ycable11=[y05,y05,y04,y04];

xcable12=[x02-5.05,x02-5.05,x04,x04];
ycable12=y04+[0.1,-0.1,-0.1,0.1];

xcable13=[x02+0.05,x02+0.05,x04+1.2,x04+1.2];
ycable13=y04+[0.1,-0.1,-0.1,0.1];

xcable14=[x02-5.05,x02-5.05,x07-0.25,x07-0.25];
ycable14=y07+[0.1,-0.1,-0.1,0.1];

xcable15=[x02+0.05,x02+0.05,x07+0.132,x07+0.132];
ycable15=y07+[0.1,-0.1,-0.1,0.1];

```

```

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_51,yres_51,[1.0,1.0,1.0],...
xres_52,yres_52,[0.0,0.0,0.0],...
xres_31,yres_31,[1.0,1.0,1.0],...
xres_32,yres_32,[0.0,0.0,0.0],...
xres_41,yres_41,[1.0,1.0,1.0],...
xres_42,yres_42,[0.0,0.0,0.0],...
xres_11,yres_11,[1.0,1.0,1.0],...
xres_12,yres_12,[0.0,0.0,0.0],...
xres_21,yres_21,[1.0,1.0,1.0],...
xres_22,yres_22,[0.0,0.0,0.0],...
xi1_1,yi1_1,[0.0,0.0,0.0],...
xi1_2,yi1_2,[1.0,1.0,1.0],...
xi1_3,yi1_3,[0.0,0.0,0.0],...
xv1_1,yv1_1,[0.0,0.0,0.0],...
xv1_2,yv1_2,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
xcable10,ycable10,[0.8,0.6,0.2],...
xcable11,ycable11,[0.8,0.6,0.2],...
xcable12,ycable12,[0.8,0.6,0.2],...
xcable13,ycable13,[0.8,0.6,0.2],...
xcable14,ycable14,[0.8,0.6,0.2],...
xcable15,ycable15,[0.8,0.6,0.2],...
'Linestyle','None')

```

text(-11,11,'Οι αντιστάσεις R₃, R₄ είναι παράλληλες με την πηγή τάσης και άρα απαλείφονται. Η αντίσταση R₅ είναι σε σειρά με την')

text(-11,10,'πηγή ρεύματος και άρα απαλείφεται επίσης. Βραχυκυκλώνοντας την πηγή τάσης και ανοικτοκυκλώνοντας την πηγή ρεύματος')

text(-11,9,'προκύπτει εύκολα ότι $R_{\{T\}}=R_{\{1\}}+R_{\{2\}}=$)

text(-4.5,9.2,nRT)

text(-4.0,9.2,'Ohm. Θα έχουμε τώρα το παρακάτω ισοδύναμο κύκλωμα:')

```

text(x01+0.5,y01+1.0,'R_1','Color',[0.9,0.2,0.0])
text(x02+0.5,y02+0.8,'R_2','Color',[0.9,0.2,0.0])
text(x03+0.5,y03-1.0,'R_3','Color',[0.9,0.2,0.0])
text(x05+0.5,y05+1.0,'R_5','Color',[0.9,0.2,0.0])
text(x04+0.5,y04+1.0,'R_4','Color',[0.9,0.2,0.0])
text(x06+1.0,y06,'J_1','Color',[0.7,0.0,0.7])
text(x07+0.5,y07+0.9,'V_1','Color',[0.0,0.2,0.9])
text(9.5,y01,'a','Color',[0.9,0.0,0.0])
text(9.5,-6.0,'b','Color',[0.9,0.0,0.0])

```

axis([-12,12,-12,12])

```

axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
elseif (snmeio==2)
axes(handles.axes1);
cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,8.5,8.5];

x05=-7;
y05=2;
th5=0;

x03=-2;
y03=2;
th3=0;

x04=-2;
y04=7;
th4=0;

x01=3;
y01=2;
th1=0;

xres_11=x01+[0.40*sin(th1),0.40*sin(th1)+1.2*cos(th1),...
-0.40*sin(th1)+1.2*cos(th1),-0.40*sin(th1)];
yres_11=y01+[-0.40*cos(th1),-0.40*cos(th1)+1.2*sin(th1),...
0.40*cos(th1)+1.2*sin(th1),0.40*cos(th1)];

xres_12=x01+[-0.05*sin(th1),-0.05*sin(th1)+0.25*cos(th1),...
-0.40*sin(th1)+0.3*cos(th1),...
0.25*sin(th1)+0.45*cos(th1),...
-0.40*sin(th1)+0.6*cos(th1),...
0.25*sin(th1)+0.75*cos(th1),...
-0.40*sin(th1)+0.9*cos(th1),...
-0.05*sin(th1)+0.95*cos(th1),...
-0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+0.95*cos(th1),...
-0.25*sin(th1)+0.9*cos(th1),...
0.40*sin(th1)+0.75*cos(th1),...
-0.25*sin(th1)+0.6*cos(th1),...
0.40*sin(th1)+0.45*cos(th1),...
-0.25*sin(th1)+0.3*cos(th1),...
0.05*sin(th1)+0.25*cos(th1),...
0.05*sin(th1)];
yres_12=y01+[0.05*cos(th1),0.05*cos(th1)+0.25*sin(th1),...
0.40*cos(th1)+0.3*sin(th1),...
-0.25*cos(th1)+0.45*sin(th1),...
0.40*cos(th1)+0.6*sin(th1),...
-0.25*cos(th1)+0.75*sin(th1),...
0.40*cos(th1)+0.9*sin(th1),...
0.05*cos(th1)+0.95*sin(th1),...
0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+0.95*sin(th1),...
0.25*cos(th1)+0.9*sin(th1),...
-0.40*cos(th1)+0.75*sin(th1),...
0.25*cos(th1)+0.6*sin(th1),...
-0.40*cos(th1)+0.45*sin(th1),...
0.25*cos(th1)+0.3*sin(th1),...
-0.05*cos(th1)+0.25*sin(th1),...
-0.05*cos(th1)];

x02=1.0;
y02=-3;
th2=pi/2;

xres_21=x02+[0.25*sin(th2),0.25*sin(th2)+1.6*cos(th2),...
-0.25*sin(th2)+1.6*cos(th2),-0.25*sin(th2)];
yres_21=y02+[-0.25*cos(th2),-0.25*cos(th2)+1.6*sin(th2),...
0.25*cos(th2)+1.6*sin(th2),0.25*cos(th2)];

xres_22=x02+[-0.03*sin(th2),-0.03*sin(th2)+0.33*cos(th2),...
-0.25*sin(th2)+0.4*cos(th2),...
0.10*sin(th2)+0.6*cos(th2),...

```



```

-0.25*sin(th2)+0.8*cos(th2),...
0.10*sin(th2)+1.0*cos(th2),...
-0.25*sin(th2)+1.2*cos(th2),...
-0.03*sin(th2)+1.27*cos(th2),...
-0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.27*cos(th2),...
-0.10*sin(th2)+1.2*cos(th2),...
0.25*sin(th2)+1.0*cos(th2),...
-0.10*sin(th2)+0.8*cos(th2),...
0.25*sin(th2)+0.6*cos(th2),...
-0.10*sin(th2)+0.4*cos(th2),...
0.03*sin(th2)+0.33*cos(th2),...
0.03*sin(th2)];
yres_22=y02+[0.03*cos(th2),0.03*cos(th2)+0.33*sin(th2),...
0.25*cos(th2)+0.4*sin(th2),...
-0.10*cos(th2)+0.6*sin(th2),...
0.25*cos(th2)+0.8*sin(th2),...
-0.10*cos(th2)+1.0*sin(th2),...
0.25*cos(th2)+1.2*sin(th2),...
0.03*cos(th2)+1.27*sin(th2),...
0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.27*sin(th2),...
0.10*cos(th2)+1.2*sin(th2),...
-0.25*cos(th2)+1.0*sin(th2),...
0.10*cos(th2)+0.8*sin(th2),...
-0.25*cos(th2)+0.6*sin(th2),...
0.10*cos(th2)+0.4*sin(th2),...
-0.03*cos(th2)+0.33*sin(th2),...
-0.03*cos(th2)];

x06=-9.0;
y06=-3.5;
phi6=0:0.01:2*pi;

xI1_1=x06+0.6*cos(phi6);
yI1_1=y06+0.9*sin(phi6);

xI1_2=x06+0.55*cos(phi6);
yI1_2=y06+0.85*sin(phi6);

xI1_3=x06+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI1_3=y06+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

x07=-9.0;
y07=-0.5;

xV1_1=x07+[-1.0,1.0,1.0,-1.0];
yV1_1=y07+[-0.05,-0.05,0.05,0.05]+0.3;

xV1_2=x07+[-0.4,0.4,0.4,-0.4];
yV1_2=y07+[-0.1,-0.1,0.1,0.1]-0.1;

xcable1=[x05+1.2,x05+1.2,x06,x06];
ycable1=y05+[0.1,-0.1,-0.1,0.1];

xcable2=x06+[-0.05,0.05,0.05,-0.05];
ycable2=[y05,y05,y07+0.35,y07+0.35];

xcable2_1=x06+[-0.05,0.05,0.05,-0.05];
ycable2_1=[y07-0.2,y07-0.2,y06+0.9,y06+0.9];

xcable3=x06+[-0.05,0.05,0.05,-0.05];
ycable3=[-6.0,-6.0,y06-0.9,y06-0.9];

xcable4=[9.0,9.0,x06,x06];
ycable4=-6.0+[0.1,-0.1,-0.1,0.1];

xcable5=[9.0,9.0,x01+1.2,x01+1.2];
ycable5=y01+[0.1,-0.1,-0.1,0.1];

xcable6=[x03,x03,x01,x01];
ycable6=y01+[0.1,-0.1,-0.1,0.1];

xcable7=[x05+1.2,x05+1.2,x03,x03];
ycable7=y01+[0.1,-0.1,-0.1,0.1];

```

```

xcable8=x02+[-0.05,0.05,0.05,-0.05];
ycable8=[y05,y05,y02+1.6,y02+1.6];

xcable9=x02+[-0.05,0.05,0.05,-0.05];
ycable9=[-6.0,-6.0,y02,y02];

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_11,yres_11,[1.0,1.0,1.0],...
xres_12,yres_12,[0.0,0.0,0.0],...
xres_21,yres_21,[1.0,1.0,1.0],...
xres_22,yres_22,[0.0,0.0,0.0],...
xI1_1,yI1_1,[0.0,0.0,0.0],...
xI1_2,yI1_2,[1.0,1.0,1.0],...
xI1_3,yI1_3,[0.0,0.0,0.0],...
xV1_1,yV1_1,[0.0,0.0,0.0],...
xV1_2,yV1_2,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable2_1,ycable2_1,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
'LineStyle','None')

text(-11,11,'Το ισοδύναμο κατά Norton από τα άκρα c,d περιέχει μόνον την πηγή ρεύματος J_1. Μετασχηματίζοντας
στο ισοδύναμο κατά Thevenin ')
text(-11,10,'έχουμε')

text(x01+0.5,y01+1.0,'R_1','Color',[0.9,0.2,0.0])
text(x02+0.5,y02+0.8,'R_2','Color',[0.9,0.2,0.0])
text(x06+1.0,y06,'J_1','Color',[0.7,0.0,0.7])
text(x07+0.5,y07+0.9,'V_1','Color',[0.0,0.2,0.9])
text(9.5,y01,'a','Color',[0.9,0.0,0.0])
text(9.5,-6.0,'b','Color',[0.9,0.0,0.0])
text(x02,y01+1.0,'c','Color',[0.9,0.0,0.0])
text(x02,-7.0,'d','Color',[0.9,0.0,0.0])

axis([-12,12,-12,12])
axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
elseif (snmeio==3)
axes(handles.axes1);
cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,8.5,8.5];

x05=-7;
y05=2;
th5=0;

x03=-2;
y03=2;
th3=0;

x04=-2;
y04=7;
th4=0;

x01=3;
y01=2;
th1=0;

xres_11=x01+[0.40*sin(th1),0.40*sin(th1)+1.2*cos(th1),...
-0.40*sin(th1)+1.2*cos(th1),-0.40*sin(th1)];
yres_11=y01+[-0.40*cos(th1),-0.40*cos(th1)+1.2*sin(th1),...
0.40*cos(th1)+1.2*sin(th1),0.40*cos(th1)];

xres_12=x01+[-0.05*sin(th1),-0.05*sin(th1)+0.25*cos(th1),...

```

```

-0.40*sin(th1)+0.3*cos(th1),...
0.25*sin(th1)+0.45*cos(th1),...
-0.40*sin(th1)+0.6*cos(th1),...
0.25*sin(th1)+0.75*cos(th1),...
-0.40*sin(th1)+0.9*cos(th1),...
-0.05*sin(th1)+0.95*cos(th1),...
-0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+0.95*cos(th1),...
-0.25*sin(th1)+0.9*cos(th1),...
0.40*sin(th1)+0.75*cos(th1),...
-0.25*sin(th1)+0.6*cos(th1),...
0.40*sin(th1)+0.45*cos(th1),...
-0.25*sin(th1)+0.3*cos(th1),...
0.05*sin(th1)+0.25*cos(th1),...
0.05*sin(th1)];
yres_12=y01+[0.05*cos(th1),0.05*cos(th1)+0.25*sin(th1),...
0.40*cos(th1)+0.3*sin(th1),...
-0.25*cos(th1)+0.45*sin(th1),...
0.40*cos(th1)+0.6*sin(th1),...
-0.250*cos(th1)+0.75*sin(th1),...
0.40*cos(th1)+0.9*sin(th1),...
0.05*cos(th1)+0.95*sin(th1),...
0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+0.95*sin(th1),...
0.25*cos(th1)+0.9*sin(th1),...
-0.40*cos(th1)+0.75*sin(th1),...
0.25*cos(th1)+0.6*sin(th1),...
-0.40*cos(th1)+0.45*sin(th1),...
0.25*cos(th1)+0.3*sin(th1),...
-0.05*cos(th1)+0.25*sin(th1),...
-0.05*cos(th1)];

x02=-3;
y02=2;
th2=0;

xres_21=x02+[0.40*sin(th2),0.40*sin(th2)+1.2*cos(th2),...
-0.40*sin(th2)+1.2*cos(th2),-0.40*sin(th2)];
yres_21=y02+[-0.40*cos(th2),-0.40*cos(th2)+1.2*sin(th2),...
0.40*cos(th2)+1.2*sin(th2),0.40*cos(th2)];

xres_22=x02+[-0.05*sin(th2),-0.05*sin(th2)+0.25*cos(th2),...
-0.40*sin(th2)+0.3*cos(th2),...
0.25*sin(th2)+0.45*cos(th2),...
-0.40*sin(th2)+0.6*cos(th2),...
0.25*sin(th2)+0.75*cos(th2),...
-0.40*sin(th2)+0.9*cos(th2),...
-0.05*sin(th2)+0.95*cos(th2),...
-0.05*sin(th2)+1.2*cos(th2),...
0.05*sin(th2)+1.2*cos(th2),...
0.05*sin(th2)+0.95*cos(th2),...
-0.25*sin(th2)+0.9*cos(th2),...
0.40*sin(th2)+0.75*cos(th2),...
-0.25*sin(th2)+0.6*cos(th2),...
0.40*sin(th2)+0.45*cos(th2),...
-0.25*sin(th2)+0.3*cos(th2),...
0.05*sin(th2)+0.25*cos(th2),...
0.05*sin(th2)];
yres_22=y02+[0.05*cos(th2),0.05*cos(th2)+0.25*sin(th2),...
0.40*cos(th2)+0.3*sin(th2),...
-0.25*cos(th2)+0.45*sin(th2),...
0.40*cos(th2)+0.6*sin(th2),...
-0.250*cos(th2)+0.75*sin(th2),...
0.40*cos(th2)+0.9*sin(th2),...
0.05*cos(th2)+0.95*sin(th2),...
0.05*cos(th2)+1.2*sin(th2),...
-0.05*cos(th2)+1.2*sin(th2),...
-0.05*cos(th2)+0.95*sin(th2),...
0.25*cos(th2)+0.9*sin(th2),...
-0.40*cos(th2)+0.75*sin(th2),...
0.25*cos(th2)+0.6*sin(th2),...
-0.40*cos(th2)+0.45*sin(th2),...
0.25*cos(th2)+0.3*sin(th2),...
-0.05*cos(th2)+0.25*sin(th2),...
-0.05*cos(th2)];

x06=-9.0;

```

```

        y06=-3.5;
        phi6=0:0.01:2*pi;

        x07=-9.0;
        y07=-1.5;

        xV1_1=x07+[-1.0,1.0,1.0,-1.0];
        yV1_1=y07+[-0.05,-0.05,0.05,0.05]+0.3;

        xV1_2=x07+[-0.4,0.4,0.4,-0.4];
        yV1_2=y07+[-0.1,-0.1,0.1,0.1]-0.1;

        xcable1=[x05+1.2,x05+1.2,x06,x06];
        ycable1=y05+[0.1,-0.1,-0.1,0.1];

        xcable2=x06+[-0.05,0.05,0.05,-0.05];
        ycable2=[y05,y05,y07+0.35,y07+0.35];

        xcable2_1=x06+[-0.05,0.05,0.05,-0.05];
        ycable2_1=[y07-0.2,y07-0.2,y06+0.9,y06+0.9];

        xcable3=x06+[-0.05,0.05,0.05,-0.05];
        ycable3=[-6.0,-6.0,y06+0.9,y06+0.9];

        xcable4=[9.0,9.0,x06,x06];
        ycable4=-6.0+[0.1,-0.1,-0.1,0.1];

        xcable5=[9.0,9.0,x01+1.2,x01+1.2];
        ycable5=y01+[0.1,-0.1,-0.1,0.1];

        xcable6=[x02+1.2,x02+1.2,x01,x01];
        ycable6=y01+[0.1,-0.1,-0.1,0.1];

        xcable7=[x05+1.2,x05+1.2,x02,x02];
        ycable7=y01+[0.1,-0.1,-0.1,0.1];

        fill(x_back,y_back,[1.0,1.0,1.0],...
        x_tableau,y_tableau,[0.6,0.6,0.6],...
        xres_11,yres_11,[1.0,1.0,1.0],...
        xres_12,yres_12,[0.0,0.0,0.0],...
        xres_21,yres_21,[1.0,1.0,1.0],...
        xres_22,yres_22,[0.0,0.0,0.0],...
        xV1_1,yV1_1,[0.0,0.0,0.0],...
        xV1_2,yV1_2,[0.0,0.0,0.0],...
        xcable1,ycable1,[0.8,0.6,0.2],...
        xcable2,ycable2,[0.8,0.6,0.2],...
        xcable2_1,ycable2_1,[0.8,0.6,0.2],...
        xcable3,ycable3,[0.8,0.6,0.2],...
        xcable4,ycable4,[0.8,0.6,0.2],...
        xcable5,ycable5,[0.8,0.6,0.2],...
        xcable6,ycable6,[0.8,0.6,0.2],...
        xcable7,ycable7,[0.8,0.6,0.2],...
        'LineStyle','None')

        text(-11,11,'A $\phi$  V_{T}=V_{2}=J_{1}R_{2}=')
        text(-7.5,11.2,nV2)
        text(-6.8,11.2,'Volt.')
```

```

        text(x01+0.5,y01+1.0,'R_1','Color',[0.9,0.2,0.0])
        text(x02+0.5,y02+0.8,'R_2','Color',[0.9,0.2,0.0])
        text(x07+0.5,y07+0.9,'V_2=J_{1}R_{2}','Color',[0.0,0.2,0.9])
        text(9.5,y01,'a','Color',[0.9,0.0,0.0])
        text(9.5,-6.0,'b','Color',[0.9,0.0,0.0])
```

```

axis([-12,12,-12,12])
axis off;
```

```
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
```

```

else
end
```

```
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
```

```
% --- Executes on button press in pushbutton4.
```

```

function pushbutton4_Callback(hObject, eventdata, handles)
% hObject    handle to pushbutton4 (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
hfin=questdlg('Εξοδος από το πρόγραμμα?');
switch hfin
case 'Yes'
closereq;
end

```

Ασκηση 7

```

function varargout = g_asknsn_7(varargin)
% G_ASKNSN_7 M-file for g_asknsn_7.fig
% G_ASKNSN_7, by itself, creates a new G_ASKNSN_7 or raises the existing
% singleton*.
%
% H = G_ASKNSN_7 returns the handle to a new G_ASKNSN_7 or the handle to
% the existing singleton*.
%
% G_ASKNSN_7('CALLBACK',hObject,eventData,handles,...) calls the local
% function named CALLBACK in G_ASKNSN_7.M with the given input arguments.
%
% G_ASKNSN_7('Property','Value',...) creates a new G_ASKNSN_7 or raises the
% existing singleton*. Starting from the left, property value pairs are
% applied to the GUI before g_asknsn_7_OpeningFcn gets called. An
% unrecognized property name or invalid value makes property application
% stop. All inputs are passed to g_asknsn_7_OpeningFcn via varargin.
%
% *See GUI Options on GUIDE's Tools menu. Choose "GUI allows only one
% instance to run (singleton)".
%
% See also: GUIDE, GUIDATA, GUIHANDLES

% Edit the above text to modify the response to help g_asknsn_7

% Last Modified by GUIDE v2.5 16-Dec-2013 04:44:05

% Begin initialization code - DO NOT EDIT
gui_Singleton = 1;
gui_State = struct('gui_Name',       mfilename, ...
                  'gui_Singleton',   gui_Singleton, ...
                  'gui_OpeningFcn', @g_asknsn_7_OpeningFcn, ...
                  'gui_OutputFcn',  @g_asknsn_7_OutputFcn, ...
                  'gui_LayoutFcn',   [], ...
                  'gui_Callback',    []);
if nargin && ischar(varargin{1})
    gui_State.gui_Callback = str2func(varargin{1});
end

if nargout
    [varargout{1:nargout}] = gui_mainfcn(gui_State, varargin{:});
else
    gui_mainfcn(gui_State, varargin{:});
end
% End initialization code - DO NOT EDIT

% --- Executes just before g_asknsn_7 is made visible.
function g_asknsn_7_OpeningFcn(hObject, eventdata, handles, varargin)
% This function has no output args, see OutputFcn.
% hObject    handle to figure
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
% varargin   command line arguments to g_asknsn_7 (see VARARGIN)

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,9,9];

x01=-8;
y01=3.5;

```

```

th1=0;

xres_11=x01+[0.40*sin(th1),0.40*sin(th1)+1.2*cos(th1),...
-0.40*sin(th1)+1.2*cos(th1),-0.40*sin(th1)];
yres_11=y01+[-0.40*cos(th1),-0.40*cos(th1)+1.2*sin(th1),...
0.40*cos(th1)+1.2*sin(th1),0.40*cos(th1)];

xres_12=x01+[-0.05*sin(th1),-0.05*sin(th1)+0.25*cos(th1),...
-0.40*sin(th1)+0.3*cos(th1),...
0.25*sin(th1)+0.45*cos(th1),...
-0.40*sin(th1)+0.6*cos(th1),...
0.25*sin(th1)+0.75*cos(th1),...
-0.40*sin(th1)+0.9*cos(th1),...
-0.05*sin(th1)+0.95*cos(th1),...
-0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+0.95*cos(th1),...
-0.25*sin(th1)+0.9*cos(th1),...
0.40*sin(th1)+0.75*cos(th1),...
-0.25*sin(th1)+0.6*cos(th1),...
0.40*sin(th1)+0.45*cos(th1),...
-0.25*sin(th1)+0.3*cos(th1),...
0.05*sin(th1)+0.25*cos(th1),...
0.05*sin(th1)];
yres_12=y01+[0.05*cos(th1),0.05*cos(th1)+0.25*sin(th1),...
0.40*cos(th1)+0.3*sin(th1),...
-0.25*cos(th1)+0.45*sin(th1),...
0.40*cos(th1)+0.6*sin(th1),...
-0.250*cos(th1)+0.75*sin(th1),...
0.40*cos(th1)+0.9*sin(th1),...
0.05*cos(th1)+0.95*sin(th1),...
0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+0.95*sin(th1),...
0.25*cos(th1)+0.9*sin(th1),...
-0.40*cos(th1)+0.75*sin(th1),...
0.25*cos(th1)+0.6*sin(th1),...
-0.40*cos(th1)+0.45*sin(th1),...
0.25*cos(th1)+0.3*sin(th1),...
-0.05*cos(th1)+0.25*sin(th1),...
-0.05*cos(th1)];

x02=-2.5;
y02=-1.5;
th2=pi/2;

xres_21=x02+[0.25*sin(th2),0.25*sin(th2)+1.6*cos(th2),...
-0.25*sin(th2)+1.6*cos(th2),-0.25*sin(th2)];
yres_21=y02+[-0.25*cos(th2),-0.25*cos(th2)+1.6*sin(th2),...
0.25*cos(th2)+1.6*sin(th2),0.25*cos(th2)];

xres_22=x02+[-0.03*sin(th2),-0.03*sin(th2)+0.33*cos(th2),...
-0.25*sin(th2)+0.4*cos(th2),...
0.10*sin(th2)+0.6*cos(th2),...
-0.25*sin(th2)+0.8*cos(th2),...
0.10*sin(th2)+1.0*cos(th2),...
-0.25*sin(th2)+1.2*cos(th2),...
-0.03*sin(th2)+1.27*cos(th2),...
-0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.27*cos(th2),...
-0.10*sin(th2)+1.2*cos(th2),...
0.25*sin(th2)+1.0*cos(th2),...
-0.10*sin(th2)+0.8*cos(th2),...
0.25*sin(th2)+0.6*cos(th2),...
-0.10*sin(th2)+0.4*cos(th2),...
0.03*sin(th2)+0.33*cos(th2),...
0.03*sin(th2)];
yres_22=y02+[0.03*cos(th2),0.03*cos(th2)+0.33*sin(th2),...
0.25*cos(th2)+0.4*sin(th2),...
-0.10*cos(th2)+0.6*sin(th2),...
0.25*cos(th2)+0.8*sin(th2),...
-0.10*cos(th2)+1.0*sin(th2),...
0.25*cos(th2)+1.2*sin(th2),...
0.03*cos(th2)+1.27*sin(th2),...
0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.27*sin(th2),...
0.10*cos(th2)+1.2*sin(th2),...
-0.25*cos(th2)+1.0*sin(th2),...
0.10*cos(th2)+0.8*sin(th2),...
0.10*cos(th2)+0.6*sin(th2),...
0.10*cos(th2)+0.4*sin(th2),...
0.03*cos(th2)];

```

```

-0.25*cos(th2)+0.6*sin(th2),...
0.10*cos(th2)+0.4*sin(th2),...
-0.03*cos(th2)+0.33*sin(th2),...
-0.03*cos(th2)];

x03=0.5;
y03=3.5;
th3=0;

xres_31=x03+[0.40*sin(th3),0.40*sin(th3)+1.2*cos(th3),...
-0.40*sin(th3)+1.2*cos(th3),-0.40*sin(th3)];
yres_31=y03+[-0.40*cos(th3),-0.40*cos(th3)+1.2*sin(th3),...
0.40*cos(th3)+1.2*sin(th3),0.40*cos(th3)];

xres_32=x03+[-0.05*sin(th3),-0.05*sin(th3)+0.25*cos(th3),...
-0.40*sin(th3)+0.3*cos(th3),...
0.25*sin(th3)+0.45*cos(th3),...
-0.40*sin(th3)+0.6*cos(th3),...
0.25*sin(th3)+0.75*cos(th3),...
-0.40*sin(th3)+0.9*cos(th3),...
-0.05*sin(th3)+0.95*cos(th3),...
-0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+0.95*cos(th3),...
-0.25*sin(th3)+0.9*cos(th3),...
0.40*sin(th3)+0.75*cos(th3),...
-0.25*sin(th3)+0.6*cos(th3),...
0.40*sin(th3)+0.45*cos(th3),...
-0.25*sin(th3)+0.3*cos(th3),...
0.05*sin(th3)+0.25*cos(th3),...
0.05*sin(th3)];
yres_32=y03+[0.05*cos(th3),0.05*cos(th3)+0.25*sin(th3),...
0.40*cos(th3)+0.3*sin(th3),...
-0.25*cos(th3)+0.45*sin(th3),...
0.40*cos(th3)+0.6*sin(th3),...
-0.25*cos(th3)+0.75*sin(th3),...
0.40*cos(th3)+0.9*sin(th3),...
0.05*cos(th3)+0.95*sin(th3),...
0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+0.95*sin(th3),...
0.25*cos(th3)+0.9*sin(th3),...
-0.40*cos(th3)+0.75*sin(th3),...
0.25*cos(th3)+0.6*sin(th3),...
-0.40*cos(th3)+0.45*sin(th3),...
0.25*cos(th3)+0.3*sin(th3),...
-0.05*cos(th3)+0.25*sin(th3),...
-0.05*cos(th3)];

x04=4.0;
y04=-1.5;
th4=pi/2;

xres_41=x04+[0.25*sin(th4),0.25*sin(th4)+1.6*cos(th4),...
-0.25*sin(th4)+1.6*cos(th4),-0.25*sin(th4)];
yres_41=y04+[-0.25*cos(th4),-0.25*cos(th4)+1.6*sin(th4),...
0.25*cos(th4)+1.6*sin(th4),0.25*cos(th4)];

xres_42=x04+[-0.03*sin(th4),-0.03*sin(th4)+0.33*cos(th4),...
-0.25*sin(th4)+0.4*cos(th4),...
0.10*sin(th4)+0.6*cos(th4),...
-0.25*sin(th4)+0.8*cos(th4),...
0.10*sin(th4)+1.0*cos(th4),...
-0.25*sin(th4)+1.2*cos(th4),...
-0.03*sin(th4)+1.27*cos(th4),...
-0.03*sin(th4)+1.6*cos(th4),...
0.03*sin(th4)+1.6*cos(th4),...
0.03*sin(th4)+1.27*cos(th4),...
-0.10*sin(th4)+1.2*cos(th4),...
0.25*sin(th4)+1.0*cos(th4),...
-0.10*sin(th4)+0.8*cos(th4),...
0.25*sin(th4)+0.6*cos(th4),...
-0.10*sin(th4)+0.4*cos(th4),...
0.03*sin(th4)+0.33*cos(th4),...
0.03*sin(th4)];
yres_42=y04+[0.03*cos(th4),0.03*cos(th4)+0.33*sin(th4),...
0.25*cos(th4)+0.4*sin(th4),...
-0.10*cos(th4)+0.6*sin(th4),...
0.25*cos(th4)+0.8*sin(th4),...
-0.10*cos(th4)+1.0*sin(th4),...

```

```

0.25*cos(th4)+1.2*sin(th4),...
0.03*cos(th4)+1.27*sin(th4),...
0.03*cos(th4)+1.6*sin(th4),...
-0.03*cos(th4)+1.6*sin(th4),...
-0.03*cos(th4)+1.27*sin(th4),...
0.10*cos(th4)+1.2*sin(th4),...
-0.25*cos(th4)+1.0*sin(th4),...
0.10*cos(th4)+0.8*sin(th4),...
-0.25*cos(th4)+0.6*sin(th4),...
0.10*cos(th4)+0.4*sin(th4),...
-0.03*cos(th4)+0.33*sin(th4),...
-0.03*cos(th4)];

x05=6.5;
y05=3.5;
th5=0;

xres_51=x05+[0.40*sin(th5),0.40*sin(th5)+1.2*cos(th5),...
-0.40*sin(th5)+1.2*cos(th5),-0.40*sin(th5)];
yres_51=y05+[-0.40*cos(th5),-0.40*cos(th5)+1.2*sin(th5),...
0.40*cos(th5)+1.2*sin(th5),0.40*cos(th5)];

xres_52=x05+[-0.05*sin(th5),-0.05*sin(th5)+0.25*cos(th5),...
-0.40*sin(th5)+0.3*cos(th5),...
0.25*sin(th5)+0.45*cos(th5),...
-0.40*sin(th5)+0.6*cos(th5),...
0.25*sin(th5)+0.75*cos(th5),...
-0.40*sin(th5)+0.9*cos(th5),...
-0.05*sin(th5)+0.95*cos(th5),...
-0.05*sin(th5)+1.2*cos(th5),...
0.05*sin(th5)+1.2*cos(th5),...
0.05*sin(th5)+0.95*cos(th5),...
-0.25*sin(th5)+0.9*cos(th5),...
0.40*sin(th5)+0.75*cos(th5),...
-0.25*sin(th5)+0.6*cos(th5),...
0.40*sin(th5)+0.45*cos(th5),...
-0.25*sin(th5)+0.3*cos(th5),...
0.05*sin(th5)+0.25*cos(th5),...
0.05*sin(th5)];
yres_52=y05+[0.05*cos(th5),0.05*cos(th5)+0.25*sin(th5),...
0.40*cos(th5)+0.3*sin(th5),...
-0.25*cos(th5)+0.45*sin(th5),...
0.40*cos(th5)+0.6*sin(th5),...
-0.25*cos(th5)+0.75*sin(th5),...
0.40*cos(th5)+0.9*sin(th5),...
0.05*cos(th5)+0.95*sin(th5),...
0.05*cos(th5)+1.2*sin(th5),...
-0.05*cos(th5)+1.2*sin(th5),...
-0.05*cos(th5)+0.95*sin(th5),...
0.25*cos(th5)+0.9*sin(th5),...
-0.40*cos(th5)+0.75*sin(th5),...
0.25*cos(th5)+0.6*sin(th5),...
-0.40*cos(th5)+0.45*sin(th5),...
0.25*cos(th5)+0.3*sin(th5),...
-0.05*cos(th5)+0.25*sin(th5),...
-0.05*cos(th5)];

x06=-9.5;
y06=-0.5;

xv1_1=x06+[-1.0,1.0,1.0,-1.0];
yv1_1=y06+[-0.05,-0.05,0.05,0.05]+0.3;

xv1_2=x06+[-0.4,0.4,0.4,-0.4];
yv1_2=y06+[-0.1,-0.1,0.1,0.1]-0.1;

x07=9.5;
y07=-0.5;

xv2_1=x07+[-1.0,1.0,1.0,-1.0];
yv2_1=y07+[-0.05,-0.05,0.05,0.05]+0.3;

xv2_2=x07+[-0.4,0.4,0.4,-0.4];
yv2_2=y07+[-0.1,-0.1,0.1,0.1]-0.1;

x08=-5.0;
y08=-0.5;
phi8=0:0.01:2*pi;

```



```

xI1_1=x08+0.6*cos(phi8);
yI1_1=y08+0.9*sin(phi8);

xI1_2=x08+0.55*cos(phi8);
yI1_2=y08+0.85*sin(phi8);

xI1_3=x08+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI1_3=y08-[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

xcable1=[-9.5,-9.5,x01,x01];
ycable1=y01+[0.1,-0.1,-0.1,0.1];

xcable2=[-9.55,-9.45,-9.45,-9.55];
ycable2=[y01+0.1,y01+0.1,y06+0.35,y06+0.35];

xcable3=[-9.55,-9.45,-9.45,-9.55];
ycable3=[-6.0,-6.0,y06-0.2,y06-0.2];

xcable4=[-9.5,-9.5,9.5,9.5];
ycable4=-6.0+[0.1,-0.1,-0.1,0.1];

xcable5=[9.55,9.45,9.45,9.55];
ycable5=[-6.0,-6.0,y07-0.2,y07-0.2];

xcable6=[9.55,9.45,9.45,9.55];
ycable6=[y01+0.1,y01+0.1,y07+0.35,y07+0.35];

xcable7=[9.5,9.5,x05+1.2,x05+1.2];
ycable7=y01+[0.1,-0.1,-0.1,0.1];

xcable8=[x05,x05,x03+1.2,x03+1.2];
ycable8=y01+[0.1,-0.1,-0.1,0.1];

xcable9=[x03,x03,x01+1.2,x01+1.2];
ycable9=y01+[0.1,-0.1,-0.1,0.1];

xcable10=x08+[-0.05,0.05,0.05,-0.05];
ycable10=[y01+0.1,y01+0.1,y08+0.9,y08+0.9];

xcable11=x08+[-0.05,0.05,0.05,-0.05];
ycable11=[-6.0,-6.0,y08-0.9,y08-0.9];

xcable12=x02+[-0.05,0.05,0.05,-0.05];
ycable12=[y01+0.1,y01+0.1,y02+1.6,y02+1.6];

xcable13=x02+[-0.05,0.05,0.05,-0.05];
ycable13=[-6.0,-6.0,y02,y02];

xcable14=x04+[-0.05,0.05,0.05,-0.05];
ycable14=[y01+0.1,y01+0.1,y04+1.6,y04+1.6];

xcable15=x04+[-0.05,0.05,0.05,-0.05];
ycable15=[-6.0,-6.0,y04,y04];

xcurr=2.5+[-3.95,-3.45,-3.45,-3.25,-3.45,-3.45,-3.95];
ycurr=y01+[0.1,0.1,0.3,0.0,-0.3,-0.1,-0.1];

```

```

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_11,yres_11,[1.0,1.0,1.0],...
xres_12,yres_12,[0.0,0.0,0.0],...
xres_21,yres_21,[1.0,1.0,1.0],...
xres_22,yres_22,[0.0,0.0,0.0],...
xres_31,yres_31,[1.0,1.0,1.0],...
xres_32,yres_32,[0.0,0.0,0.0],...
xres_41,yres_41,[1.0,1.0,1.0],...
xres_42,yres_42,[0.0,0.0,0.0],...
xres_51,yres_51,[1.0,1.0,1.0],...
xres_52,yres_52,[0.0,0.0,0.0],...
xV1_1,yV1_1,[0.0,0.0,0.0],...
xV1_2,yV1_2,[0.0,0.0,0.0],...
xV2_1,yV2_1,[0.0,0.0,0.0],...
xV2_2,yV2_2,[0.0,0.0,0.0],...

```

```

        xI1_1,yI1_1,[0.0,0.0,0.0],...
        xI1_2,yI1_2,[1.0,1.0,1.0],...
        xI1_3,yI1_3,[0.0,0.0,0.0],...
        xcable1,ycable1,[0.8,0.6,0.2],...
        xcable2,ycable2,[0.8,0.6,0.2],...
        xcable3,ycable3,[0.8,0.6,0.2],...
        xcable4,ycable4,[0.8,0.6,0.2],...
        xcable5,ycable5,[0.8,0.6,0.2],...
        xcable6,ycable6,[0.8,0.6,0.2],...
        xcable7,ycable7,[0.8,0.6,0.2],...
        xcable8,ycable8,[0.8,0.6,0.2],...
        xcable9,ycable9,[0.8,0.6,0.2],...
        xcable10,ycable10,[0.8,0.6,0.2],...
        xcable11,ycable11,[0.8,0.6,0.2],...
        xcable12,ycable12,[0.8,0.6,0.2],...
        xcable13,ycable13,[0.8,0.6,0.2],...
        xcable14,ycable14,[0.8,0.6,0.2],...
        xcable15,ycable15,[0.8,0.6,0.2],...
        xcurr,ycurr,[0.0,0.0,0.0],...
        'LineStyle','None')

text(-11,11,'Στο παρακάτω κύκλωμα να προσδιοριστεί το ρεύμα I με χρήση των θεωρημάτων Thevenin και Norton.')

text(x01+0.5,y01+1.0,'R_1','Color',[0.9,0.2,0.0])
text(x02+0.5,y02+0.8,'R_2','Color',[0.9,0.2,0.0])
text(x03+0.5,y03+1.0,'R_3','Color',[0.9,0.2,0.0])
text(x04+0.5,y04+0.8,'R_4','Color',[0.9,0.2,0.0])
text(x05+0.5,y05+1.0,'R_5','Color',[0.9,0.2,0.0])
text(-10.5,1.0,'V_1','Color',[0.0,0.2,0.9])
text(10.0,1.0,'V_2','Color',[0.0,0.2,0.9])
text(x08+0.7,y08,'J_1','Color',[0.0,0.4,0.4])
text(-1.2,y01+1.0,'I','Color',[0.0,0.0,0.0])
text(-2.6,4.3,'a','Color',[0.1,0.1,0.1])
text(-2.6,-6.7,'b','Color',[0.1,0.1,0.1])
text(x04-0.2,4.3,'c','Color',[0.1,0.1,0.1])
text(x04-0.2,-6.7,'d','Color',[0.1,0.1,0.1])

axis([-12,12,-12,12])
axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

% Choose default command line output for g_asknsn_7
handles.output = hObject;

% Update handles structure
guidata(hObject, handles);

% UIWAIT makes g_asknsn_7 wait for user response (see UIRESUME)
% uiwait(handles.figure1);

% --- Outputs from this function are returned to the command line.
function varargout = g_asknsn_7_OutputFcn(hObject, eventdata, handles)
% varargout cell array for returning output args (see VARARGOUT);
% hObject handle to figure
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

% Get default command line output from handles structure
varargout{1} = handles.output;

function edit1_Callback(hObject, eventdata, handles)
% hObject handle to edit1 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit1 as text
% str2double(get(hObject,'String')) returns contents of edit1 as a double
%

% --- Executes during object creation, after setting all properties.
function edit1_CreateFcn(hObject, eventdata, handles)

```

```

        % hObject    handle to edit1 (see GCBO)
    % eventdata reserved - to be defined in a future version of MATLAB
    % handles      empty - handles not created until after all CreateFcns called

    % Hint: edit controls usually have a white background on Windows.
    %           See ISPC and COMPUTER.
    if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
        set(hObject,'BackgroundColor','white');
    end

function edit2_Callback(hObject, eventdata, handles)
    % hObject    handle to edit2 (see GCBO)
    % eventdata reserved - to be defined in a future version of MATLAB
    % handles    structure with handles and user data (see GUIDATA)

    % Hints: get(hObject,'String') returns contents of edit2 as text
    % str2double(get(hObject,'String')) returns contents of edit2 as a double

    % --- Executes during object creation, after setting all properties.
    function edit2_CreateFcn(hObject, eventdata, handles)
        % hObject    handle to edit2 (see GCBO)
        % eventdata reserved - to be defined in a future version of MATLAB
        % handles    empty - handles not created until after all CreateFcns called

        % Hint: edit controls usually have a white background on Windows.
        %           See ISPC and COMPUTER.
        if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
            set(hObject,'BackgroundColor','white');
        end

function edit3_Callback(hObject, eventdata, handles)
    % hObject    handle to edit3 (see GCBO)
    % eventdata reserved - to be defined in a future version of MATLAB
    % handles    structure with handles and user data (see GUIDATA)

    % Hints: get(hObject,'String') returns contents of edit3 as text
    % str2double(get(hObject,'String')) returns contents of edit3 as a double

    % --- Executes during object creation, after setting all properties.
    function edit3_CreateFcn(hObject, eventdata, handles)
        % hObject    handle to edit3 (see GCBO)
        % eventdata reserved - to be defined in a future version of MATLAB
        % handles    empty - handles not created until after all CreateFcns called

        % Hint: edit controls usually have a white background on Windows.
        %           See ISPC and COMPUTER.
        if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
            set(hObject,'BackgroundColor','white');
        end

function edit4_Callback(hObject, eventdata, handles)
    % hObject    handle to edit4 (see GCBO)
    % eventdata reserved - to be defined in a future version of MATLAB
    % handles    structure with handles and user data (see GUIDATA)

    % Hints: get(hObject,'String') returns contents of edit4 as text
    % str2double(get(hObject,'String')) returns contents of edit4 as a double

    % --- Executes during object creation, after setting all properties.
    function edit4_CreateFcn(hObject, eventdata, handles)
        % hObject    handle to edit4 (see GCBO)
        % eventdata reserved - to be defined in a future version of MATLAB
        % handles    empty - handles not created until after all CreateFcns called

        % Hint: edit controls usually have a white background on Windows.
        %           See ISPC and COMPUTER.
        if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
            set(hObject,'BackgroundColor','white');
        end
end

```

```

        function edit5_Callback(hObject, eventdata, handles)
            % hObject      handle to edit5 (see GCBO)
            % eventdata  reserved - to be defined in a future version of MATLAB
            % handles     structure with handles and user data (see GUIDATA)

            % Hints: get(hObject,'String') returns contents of edit5 as text
            % str2double(get(hObject,'String')) returns contents of edit5 as a double

            % --- Executes during object creation, after setting all properties.
            function edit5_CreateFcn(hObject, eventdata, handles)
                % hObject      handle to edit5 (see GCBO)
                % eventdata  reserved - to be defined in a future version of MATLAB
                % handles     empty - handles not created until after all CreateFcns called

                % Hint: edit controls usually have a white background on Windows.
                %         See ISPC and COMPUTER.
            if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
                set(hObject,'BackgroundColor','white');
            end

        function edit6_Callback(hObject, eventdata, handles)
            % hObject      handle to edit6 (see GCBO)
            % eventdata  reserved - to be defined in a future version of MATLAB
            % handles     structure with handles and user data (see GUIDATA)

            % Hints: get(hObject,'String') returns contents of edit6 as text
            % str2double(get(hObject,'String')) returns contents of edit6 as a double

            % --- Executes during object creation, after setting all properties.
            function edit6_CreateFcn(hObject, eventdata, handles)
                % hObject      handle to edit6 (see GCBO)
                % eventdata  reserved - to be defined in a future version of MATLAB
                % handles     empty - handles not created until after all CreateFcns called

                % Hint: edit controls usually have a white background on Windows.
                %         See ISPC and COMPUTER.
            if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
                set(hObject,'BackgroundColor','white');
            end

        function edit7_Callback(hObject, eventdata, handles)
            % hObject      handle to edit7 (see GCBO)
            % eventdata  reserved - to be defined in a future version of MATLAB
            % handles     structure with handles and user data (see GUIDATA)

            % Hints: get(hObject,'String') returns contents of edit7 as text
            % str2double(get(hObject,'String')) returns contents of edit7 as a double

            % --- Executes during object creation, after setting all properties.
            function edit7_CreateFcn(hObject, eventdata, handles)
                % hObject      handle to edit7 (see GCBO)
                % eventdata  reserved - to be defined in a future version of MATLAB
                % handles     empty - handles not created until after all CreateFcns called

                % Hint: edit controls usually have a white background on Windows.
                %         See ISPC and COMPUTER.
            if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
                set(hObject,'BackgroundColor','white');
            end

        function edit8_Callback(hObject, eventdata, handles)
            % hObject      handle to edit8 (see GCBO)
            % eventdata  reserved - to be defined in a future version of MATLAB
            % handles     structure with handles and user data (see GUIDATA)

            % Hints: get(hObject,'String') returns contents of edit8 as text
            % str2double(get(hObject,'String')) returns contents of edit8 as a double

            % --- Executes during object creation, after setting all properties.
            function edit8_CreateFcn(hObject, eventdata, handles)
                % hObject      handle to edit8 (see GCBO)

```

```

% eventdata reserved - to be defined in a future version of MATLAB
% handles empty - handles not created until after all CreateFcns called

% Hint: edit controls usually have a white background on Windows.
% See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUiControlBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

% --- Executes on button press in pushbutton1.
function pushbutton1_Callback(hObject, eventdata, handles)
% hObject handle to pushbutton1 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
global R1;
global R2;
global R3;
global R4;
global R5;
global V1;
global V2;
global J1;

R1=str2double(get(handles.edit1,'String'));
R2=str2double(get(handles.edit2,'String'));
R3=str2double(get(handles.edit3,'String'));
R4=str2double(get(handles.edit4,'String'));
R5=str2double(get(handles.edit5,'String'));
V1=str2double(get(handles.edit6,'String'));
V2=str2double(get(handles.edit7,'String'));
J1=str2double(get(handles.edit8,'String'));

if (R1>10|R1<1)
h=warndlg('Βάλτε στην αντίσταση R1 τιμή μεταξύ 1 και 10');
return
end

if (R2>10|R2<1)
h=warndlg('Βάλτε στην αντίσταση R2 τιμή μεταξύ 1 και 10');
return
end

if (R3>10|R3<1)
h=warndlg('Βάλτε στην αντίσταση R3 τιμή μεταξύ 1 και 10');
return
end

if (R4>10|R4<1)
h=warndlg('Βάλτε στην αντίσταση R4 τιμή μεταξύ 1 και 10');
return
end

if (R5>10|R5<1)
h=warndlg('Βάλτε στην αντίσταση R5 τιμή μεταξύ 1 και 10');
return
end

if (V1>15|V1<5)
h=warndlg('Βάλτε στην τάση V1 τιμή μεταξύ 5 και 15');
return
end

if (V2>15|V2<5)
h=warndlg('Βάλτε στην τάση V2 τιμή μεταξύ 5 και 15');
return
end

if (J1>5|J1<1)
h=warndlg('Βάλτε στο ρεύμα J1 τιμή μεταξύ 1 και 5');
return
end

axes(handles.axes1)
axis off;
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
global snmeio;

```

```

                                snmeio=1;
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
                                x_back=[-12,12,12,-12];
                                y_back=[-12,-12,12,12];

                                x_tableau=[-11,11,11,-11];
                                y_tableau=[-11,-11,9,9];

                                x01=-8;
                                y01=3.5;
                                th1=0;

                                xres_11=x01+[0.40*sin(th1),0.40*sin(th1)+1.2*cos(th1),...
                                                -0.40*sin(th1)+1.2*cos(th1),-0.40*sin(th1)];
                                yres_11=y01+[-0.40*cos(th1),-0.40*cos(th1)+1.2*sin(th1),...
                                                0.40*cos(th1)+1.2*sin(th1),0.40*cos(th1)];

                                xres_12=x01+[-0.05*sin(th1),-0.05*sin(th1)+0.25*cos(th1),...
                                                -0.40*sin(th1)+0.3*cos(th1),...
                                                0.25*sin(th1)+0.45*cos(th1),...
                                                -0.40*sin(th1)+0.6*cos(th1),...
                                                0.25*sin(th1)+0.75*cos(th1),...
                                                -0.40*sin(th1)+0.9*cos(th1),...
                                                -0.05*sin(th1)+0.95*cos(th1),...
                                                -0.05*sin(th1)+1.2*cos(th1),...
                                                0.05*sin(th1)+1.2*cos(th1),...
                                                0.05*sin(th1)+0.95*cos(th1),...
                                                -0.25*sin(th1)+0.9*cos(th1),...
                                                0.40*sin(th1)+0.75*cos(th1),...
                                                -0.25*sin(th1)+0.6*cos(th1),...
                                                0.40*sin(th1)+0.45*cos(th1),...
                                                -0.25*sin(th1)+0.3*cos(th1),...
                                                0.05*sin(th1)+0.25*cos(th1),...
                                                0.05*sin(th1)];
                                yres_12=y01+[0.05*cos(th1),0.05*cos(th1)+0.25*sin(th1),...
                                                0.40*cos(th1)+0.3*sin(th1),...
                                                -0.25*cos(th1)+0.45*sin(th1),...
                                                0.40*cos(th1)+0.6*sin(th1),...
                                                -0.250*cos(th1)+0.75*sin(th1),...
                                                0.40*cos(th1)+0.9*sin(th1),...
                                                0.05*cos(th1)+0.95*sin(th1),...
                                                0.05*cos(th1)+1.2*sin(th1),...
                                                -0.05*cos(th1)+1.2*sin(th1),...
                                                -0.05*cos(th1)+0.95*sin(th1),...
                                                0.25*cos(th1)+0.9*sin(th1),...
                                                -0.40*cos(th1)+0.75*sin(th1),...
                                                0.25*cos(th1)+0.6*sin(th1),...
                                                -0.40*cos(th1)+0.45*sin(th1),...
                                                0.25*cos(th1)+0.3*sin(th1),...
                                                -0.05*cos(th1)+0.25*sin(th1),...
                                                -0.05*cos(th1)];

                                x02=-2.5;
                                y02=-1.5;
                                th2=pi/2;

                                xres_21=x02+[0.25*sin(th2),0.25*sin(th2)+1.6*cos(th2),...
                                                -0.25*sin(th2)+1.6*cos(th2),-0.25*sin(th2)];
                                yres_21=y02+[-0.25*cos(th2),-0.25*cos(th2)+1.6*sin(th2),...
                                                0.25*cos(th2)+1.6*sin(th2),0.25*cos(th2)];

                                xres_22=x02+[-0.03*sin(th2),-0.03*sin(th2)+0.33*cos(th2),...
                                                -0.25*sin(th2)+0.4*cos(th2),...
                                                0.10*sin(th2)+0.6*cos(th2),...
                                                -0.25*sin(th2)+0.8*cos(th2),...
                                                0.10*sin(th2)+1.0*cos(th2),...
                                                -0.25*sin(th2)+1.2*cos(th2),...
                                                -0.03*sin(th2)+1.27*cos(th2),...
                                                -0.03*sin(th2)+1.6*cos(th2),...
                                                0.03*sin(th2)+1.6*cos(th2),...
                                                0.03*sin(th2)+1.27*cos(th2),...
                                                -0.10*sin(th2)+1.2*cos(th2),...
                                                0.25*sin(th2)+1.0*cos(th2),...
                                                -0.10*sin(th2)+0.8*cos(th2),...
                                                0.25*sin(th2)+0.6*cos(th2),...
                                                -0.10*sin(th2)+0.4*cos(th2),...
                                                0.03*sin(th2)+0.33*cos(th2),...
                                                0.03*sin(th2)];
                                yres_22=y02+[0.03*cos(th2),0.03*cos(th2)+0.33*sin(th2),...

```

```

0.25*cos(th2)+0.4*sin(th2),...
-0.10*cos(th2)+0.6*sin(th2),...
0.25*cos(th2)+0.8*sin(th2),...
-0.10*cos(th2)+1.0*sin(th2),...
0.25*cos(th2)+1.2*sin(th2),...
0.03*cos(th2)+1.27*sin(th2),...
0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.27*sin(th2),...
0.10*cos(th2)+1.2*sin(th2),...
-0.25*cos(th2)+1.0*sin(th2),...
0.10*cos(th2)+0.8*sin(th2),...
-0.25*cos(th2)+0.6*sin(th2),...
0.10*cos(th2)+0.4*sin(th2),...
-0.03*cos(th2)+0.33*sin(th2),...
-0.03*cos(th2)];

x03=0.5;
y03=3.5;
th3=0;

xres_31=x03+[0.40*sin(th3),0.40*sin(th3)+1.2*cos(th3),...
-0.40*sin(th3)+1.2*cos(th3),-0.40*sin(th3)];
yres_31=y03+[-0.40*cos(th3),-0.40*cos(th3)+1.2*sin(th3),...
0.40*cos(th3)+1.2*sin(th3),0.40*cos(th3)];

xres_32=x03+[-0.05*sin(th3),-0.05*sin(th3)+0.25*cos(th3),...
-0.40*sin(th3)+0.3*cos(th3),...
0.25*sin(th3)+0.45*cos(th3),...
-0.40*sin(th3)+0.6*cos(th3),...
0.25*sin(th3)+0.75*cos(th3),...
-0.40*sin(th3)+0.9*cos(th3),...
-0.05*sin(th3)+0.95*cos(th3),...
-0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+0.95*cos(th3),...
-0.25*sin(th3)+0.9*cos(th3),...
0.40*sin(th3)+0.75*cos(th3),...
-0.25*sin(th3)+0.6*cos(th3),...
0.40*sin(th3)+0.45*cos(th3),...
-0.25*sin(th3)+0.3*cos(th3),...
0.05*sin(th3)+0.25*cos(th3),...
0.05*sin(th3)];
yres_32=y03+[0.05*cos(th3),0.05*cos(th3)+0.25*sin(th3),...
0.40*cos(th3)+0.3*sin(th3),...
-0.25*cos(th3)+0.45*sin(th3),...
0.40*cos(th3)+0.6*sin(th3),...
-0.250*cos(th3)+0.75*sin(th3),...
0.40*cos(th3)+0.9*sin(th3),...
0.05*cos(th3)+0.95*sin(th3),...
0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+0.95*sin(th3),...
0.25*cos(th3)+0.9*sin(th3),...
-0.40*cos(th3)+0.75*sin(th3),...
0.25*cos(th3)+0.6*sin(th3),...
-0.40*cos(th3)+0.45*sin(th3),...
0.25*cos(th3)+0.3*sin(th3),...
-0.05*cos(th3)+0.25*sin(th3),...
-0.05*cos(th3)];

x04=4.0;
y04=-1.5;
th4=pi/2;

xres_41=x04+[0.25*sin(th4),0.25*sin(th4)+1.6*cos(th4),...
-0.25*sin(th4)+1.6*cos(th4),-0.25*sin(th4)];
yres_41=y04+[-0.25*cos(th4),-0.25*cos(th4)+1.6*sin(th4),...
0.25*cos(th4)+1.6*sin(th4),0.25*cos(th4)];

xres_42=x04+[-0.03*sin(th4),-0.03*sin(th4)+0.33*cos(th4),...
-0.25*sin(th4)+0.4*cos(th4),...
0.10*sin(th4)+0.6*cos(th4),...
-0.25*sin(th4)+0.8*cos(th4),...
0.10*sin(th4)+1.0*cos(th4),...
-0.25*sin(th4)+1.2*cos(th4),...
-0.03*sin(th4)+1.27*cos(th4),...
-0.03*sin(th4)+1.6*cos(th4),...
0.03*sin(th4)+1.6*cos(th4),...
0.03*sin(th4)+1.27*cos(th4),...

```

```

-0.10*sin(th4)+1.2*cos(th4),...
0.25*sin(th4)+1.0*cos(th4),...
-0.10*sin(th4)+0.8*cos(th4),...
0.25*sin(th4)+0.6*cos(th4),...
-0.10*sin(th4)+0.4*cos(th4),...
0.03*sin(th4)+0.33*cos(th4),...
0.03*sin(th4)];
yres_42=y04+[0.03*cos(th4),0.03*cos(th4)+0.33*sin(th4),...
0.25*cos(th4)+0.4*sin(th4),...
-0.10*cos(th4)+0.6*sin(th4),...
0.25*cos(th4)+0.8*sin(th4),...
-0.10*cos(th4)+1.0*sin(th4),...
0.25*cos(th4)+1.2*sin(th4),...
0.03*cos(th4)+1.27*sin(th4),...
0.03*cos(th4)+1.6*sin(th4),...
-0.03*cos(th4)+1.6*sin(th4),...
-0.03*cos(th4)+1.27*sin(th4),...
0.10*cos(th4)+1.2*sin(th4),...
-0.25*cos(th4)+1.0*sin(th4),...
0.10*cos(th4)+0.8*sin(th4),...
-0.25*cos(th4)+0.6*sin(th4),...
0.10*cos(th4)+0.4*sin(th4),...
-0.03*cos(th4)+0.33*sin(th4),...
-0.03*cos(th4)];

x05=6.5;
y05=3.5;
th5=0;

xres_51=x05+[0.40*sin(th5),0.40*sin(th5)+1.2*cos(th5),...
-0.40*sin(th5)+1.2*cos(th5),-0.40*sin(th5)];
yres_51=y05+[-0.40*cos(th5),-0.40*cos(th5)+1.2*sin(th5),...
0.40*cos(th5)+1.2*sin(th5),0.40*cos(th5)];

xres_52=x05+[-0.05*sin(th5),-0.05*sin(th5)+0.25*cos(th5),...
-0.40*sin(th5)+0.3*cos(th5),...
0.25*sin(th5)+0.45*cos(th5),...
-0.40*sin(th5)+0.6*cos(th5),...
0.25*sin(th5)+0.75*cos(th5),...
-0.40*sin(th5)+0.9*cos(th5),...
-0.05*sin(th5)+0.95*cos(th5),...
-0.05*sin(th5)+1.2*cos(th5),...
0.05*sin(th5)+1.2*cos(th5),...
0.05*sin(th5)+0.95*cos(th5),...
-0.25*sin(th5)+0.9*cos(th5),...
0.40*sin(th5)+0.75*cos(th5),...
-0.25*sin(th5)+0.6*cos(th5),...
0.40*sin(th5)+0.45*cos(th5),...
-0.25*sin(th5)+0.3*cos(th5),...
0.05*sin(th5)+0.25*cos(th5),...
0.05*sin(th5)];
yres_52=y05+[0.05*cos(th5),0.05*cos(th5)+0.25*sin(th5),...
0.40*cos(th5)+0.3*sin(th5),...
-0.25*cos(th5)+0.45*sin(th5),...
0.40*cos(th5)+0.6*sin(th5),...
-0.250*cos(th5)+0.75*sin(th5),...
0.40*cos(th5)+0.9*sin(th5),...
0.05*cos(th5)+0.95*sin(th5),...
0.05*cos(th5)+1.2*sin(th5),...
-0.05*cos(th5)+1.2*sin(th5),...
-0.05*cos(th5)+0.95*sin(th5),...
0.25*cos(th5)+0.9*sin(th5),...
-0.40*cos(th5)+0.75*sin(th5),...
0.25*cos(th5)+0.6*sin(th5),...
-0.40*cos(th5)+0.45*sin(th5),...
0.25*cos(th5)+0.3*sin(th5),...
-0.05*cos(th5)+0.25*sin(th5),...
-0.05*cos(th5)];

x06=-9.5;
y06=-0.5;

xv1_1=x06+[-1.0,1.0,1.0,-1.0];
yv1_1=y06+[-0.05,-0.05,0.05,0.05]+0.3;

xv1_2=x06+[-0.4,0.4,0.4,-0.4];
yv1_2=y06+[-0.1,-0.1,0.1,0.1]-0.1;

x07=9.5;

```



```

y07=-0.5;

xv2_1=x07+[-1.0,1.0,1.0,-1.0];
yv2_1=y07+[-0.05,-0.05,0.05,0.05]+0.3;

xv2_2=x07+[-0.4,0.4,0.4,-0.4];
yv2_2=y07+[-0.1,-0.1,0.1,0.1]-0.1;

x08=-5.0;
y08=-0.5;
phi8=0:0.01:2*pi;

xI1_1=x08+0.6*cos(phi8);
yI1_1=y08+0.9*sin(phi8);

xI1_2=x08+0.55*cos(phi8);
yI1_2=y08+0.85*sin(phi8);

xI1_3=x08+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI1_3=y08-[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

xcable1=[-9.5,-9.5,x01,x01];
ycable1=y01+[0.1,-0.1,-0.1,0.1];

xcable2=[-9.55,-9.45,-9.45,-9.55];
ycable2=[y01+0.1,y01+0.1,y06+0.35,y06+0.35];

xcable3=[-9.55,-9.45,-9.45,-9.55];
ycable3=[-6.0,-6.0,y06-0.2,y06-0.2];

xcable4=[-9.5,-9.5,9.5,9.5];
ycable4=-6.0+[0.1,-0.1,-0.1,0.1];

xcable5=[9.55,9.45,9.45,9.55];
ycable5=[-6.0,-6.0,y07-0.2,y07-0.2];

xcable6=[9.55,9.45,9.45,9.55];
ycable6=[y01+0.1,y01+0.1,y07+0.35,y07+0.35];

xcable7=[9.5,9.5,x05+1.2,x05+1.2];
ycable7=y01+[0.1,-0.1,-0.1,0.1];

xcable8=[x05,x05,x03+1.2,x03+1.2];
ycable8=y01+[0.1,-0.1,-0.1,0.1];

xcable9=[x03,x03,x01+1.2,x01+1.2];
ycable9=y01+[0.1,-0.1,-0.1,0.1];

xcable10=x08+[-0.05,0.05,0.05,-0.05];
ycable10=[y01+0.1,y01+0.1,y08+0.9,y08+0.9];

xcable11=x08+[-0.05,0.05,0.05,-0.05];
ycable11=[-6.0,-6.0,y08-0.9,y08-0.9];

xcable12=x02+[-0.05,0.05,0.05,-0.05];
ycable12=[y01+0.1,y01+0.1,y02+1.6,y02+1.6];

xcable13=x02+[-0.05,0.05,0.05,-0.05];
ycable13=[-6.0,-6.0,y02,y02];

xcable14=x04+[-0.05,0.05,0.05,-0.05];
ycable14=[y01+0.1,y01+0.1,y04+1.6,y04+1.6];

xcable15=x04+[-0.05,0.05,0.05,-0.05];
ycable15=[-6.0,-6.0,y04,y04];

xcurr=2.5+[-3.95,-3.45,-3.45,-3.25,-3.45,-3.45,-3.95];
ycurr=y01+[0.1,0.1,0.3,0.0,-0.3,-0.1,-0.1];

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_11,yres_11,[1.0,1.0,1.0],...
xres_12,yres_12,[0.0,0.0,0.0],...

```

```

xres_21,yres_21,[1.0,1.0,1.0],...
xres_22,yres_22,[0.0,0.0,0.0],...
xres_31,yres_31,[1.0,1.0,1.0],...
xres_32,yres_32,[0.0,0.0,0.0],...
xres_41,yres_41,[1.0,1.0,1.0],...
xres_42,yres_42,[0.0,0.0,0.0],...
xres_51,yres_51,[1.0,1.0,1.0],...
xres_52,yres_52,[0.0,0.0,0.0],...
xV1_1,yV1_1,[0.0,0.0,0.0],...
xV1_2,yV1_2,[0.0,0.0,0.0],...
xV2_1,yV2_1,[0.0,0.0,0.0],...
xV2_2,yV2_2,[0.0,0.0,0.0],...
xI1_1,yI1_1,[0.0,0.0,0.0],...
xI1_2,yI1_2,[1.0,1.0,1.0],...
xI1_3,yI1_3,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
xcable10,ycable10,[0.8,0.6,0.2],...
xcable11,ycable11,[0.8,0.6,0.2],...
xcable12,ycable12,[0.8,0.6,0.2],...
xcable13,ycable13,[0.8,0.6,0.2],...
xcable14,ycable14,[0.8,0.6,0.2],...
xcable15,ycable15,[0.8,0.6,0.2],...
xcurr,ycurr,[0.0,0.0,0.0],...
    'Linestyle','None')

text(-11,11,'Θεωρούμε αρχικά το ισοδύναμο κύκλωμα από τα άκρα a, b. Θα έχουμε')

text(x01+0.5,y01+1.0,'R_1','Color',[0.9,0.2,0.0])
text(x02+0.5,y02+0.8,'R_2','Color',[0.9,0.2,0.0])
text(x03+0.5,y03+1.0,'R_3','Color',[0.9,0.2,0.0])
text(x04+0.5,y04+0.8,'R_4','Color',[0.9,0.2,0.0])
text(x05+0.5,y05+1.0,'R_5','Color',[0.9,0.2,0.0])
text(-10.5,1.0,'V_1','Color',[0.0,0.2,0.9])
text(10.0,1.0,'V_2','Color',[0.0,0.2,0.9])
text(x08+0.7,y08,'J_1','Color',[0.0,0.4,0.4])
text(-1.2,y01+1.0,'I','Color',[0.0,0.0,0.0])
text(-2.6,4.3,'a','Color',[0.1,0.1,0.1])
text(-2.6,-6.7,'b','Color',[0.1,0.1,0.1])
text(x04-0.2,4.3,'c','Color',[0.1,0.1,0.1])
text(x04-0.2,-6.7,'d','Color',[0.1,0.1,0.1])

axis([-12,12,-12,12])
axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

% --- Executes on button press in pushbutton2.
function pushbutton2_Callback(hObject, eventdata, handles)
% hObject handle to pushbutton2 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

global R1;
global R2;
global R3;
global R4;
global R5;
global V1;
global V2;
global J1;

global snmeio;

snmeio=snmeio+1;

if (snmeio==6)
    snmeio=1;
end

```

```

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
J2=V1/R1;
nJ2=num2str(0.01*round(100*J2));
J3=J2-J1;
nJ3=num2str(0.01*round(100*J3));
R12=R1*R2/(R1+R2);
RT1=R12;
nR12=num2str(0.01*round(100*R12));
VT1=J3*R12;
nVT1=num2str(0.01*round(100*VT1));
RT2=R4*R5/(R4+R5);
nRT2=num2str(0.01*round(100*RT2));
VT2=R4*V2/(R4+R5);
nVT2=num2str(0.01*round(100*VT2));
I=(VT1-VT2)/(RT1+R3+RT2);
nI=num2str(0.01*round(100*I));
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
if (snmeio==1)
axes(handles.axes1);
cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,9,9];

x01=-8;
y01=3.5;
th1=0;

xres_11=x01+[0.40*sin(th1),0.40*sin(th1)+1.2*cos(th1),...
-0.40*sin(th1)+1.2*cos(th1),-0.40*sin(th1)];
yres_11=y01+[-0.40*cos(th1),-0.40*cos(th1)+1.2*sin(th1),...
0.40*cos(th1)+1.2*sin(th1),0.40*cos(th1)];

xres_12=x01+[-0.05*sin(th1),-0.05*sin(th1)+0.25*cos(th1),...
-0.40*sin(th1)+0.3*cos(th1),...
0.25*sin(th1)+0.45*cos(th1),...
-0.40*sin(th1)+0.6*cos(th1),...
0.25*sin(th1)+0.75*cos(th1),...
-0.40*sin(th1)+0.9*cos(th1),...
-0.05*sin(th1)+0.95*cos(th1),...
-0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+0.95*cos(th1),...
-0.25*sin(th1)+0.9*cos(th1),...
0.40*sin(th1)+0.75*cos(th1),...
-0.25*sin(th1)+0.6*cos(th1),...
0.40*sin(th1)+0.45*cos(th1),...
-0.25*sin(th1)+0.3*cos(th1),...
0.05*sin(th1)+0.25*cos(th1),...
0.05*sin(th1)];
yres_12=y01+[0.05*cos(th1),0.05*cos(th1)+0.25*sin(th1),...
0.40*cos(th1)+0.3*sin(th1),...
-0.25*cos(th1)+0.45*sin(th1),...
0.40*cos(th1)+0.6*sin(th1),...
-0.250*cos(th1)+0.75*sin(th1),...
0.40*cos(th1)+0.9*sin(th1),...
0.05*cos(th1)+0.95*sin(th1),...
0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+0.95*sin(th1),...
0.25*cos(th1)+0.9*sin(th1),...
-0.40*cos(th1)+0.75*sin(th1),...
0.25*cos(th1)+0.6*sin(th1),...
-0.40*cos(th1)+0.45*sin(th1),...
0.25*cos(th1)+0.3*sin(th1),...
-0.05*cos(th1)+0.25*sin(th1),...
-0.05*cos(th1)];

x02=-2.5;
y02=-1.5;
th2=pi/2;

xres_21=x02+[0.25*sin(th2),0.25*sin(th2)+1.6*cos(th2),...
-0.25*sin(th2)+1.6*cos(th2),-0.25*sin(th2)];
yres_21=y02+[-0.25*cos(th2),-0.25*cos(th2)+1.6*sin(th2),...
0.25*cos(th2)+1.6*sin(th2),0.25*cos(th2)];

```

```

xres_22=x02+[-0.03*sin(th2),-0.03*sin(th2)+0.33*cos(th2),...
-0.25*sin(th2)+0.4*cos(th2),...
0.10*sin(th2)+0.6*cos(th2),...
-0.25*sin(th2)+0.8*cos(th2),...
0.10*sin(th2)+1.0*cos(th2),...
-0.25*sin(th2)+1.2*cos(th2),...
-0.03*sin(th2)+1.27*cos(th2),...
-0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.27*cos(th2),...
-0.10*sin(th2)+1.2*cos(th2),...
0.25*sin(th2)+1.0*cos(th2),...
-0.10*sin(th2)+0.8*cos(th2),...
0.25*sin(th2)+0.6*cos(th2),...
-0.10*sin(th2)+0.4*cos(th2),...
0.03*sin(th2)+0.33*cos(th2),...
0.03*sin(th2)];
yres_22=y02+[0.03*cos(th2),0.03*cos(th2)+0.33*sin(th2),...
0.25*cos(th2)+0.4*sin(th2),...
-0.10*cos(th2)+0.6*sin(th2),...
0.25*cos(th2)+0.8*sin(th2),...
-0.10*cos(th2)+1.0*sin(th2),...
0.25*cos(th2)+1.2*sin(th2),...
0.03*cos(th2)+1.27*sin(th2),...
0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.27*sin(th2),...
0.10*cos(th2)+1.2*sin(th2),...
-0.25*cos(th2)+1.0*sin(th2),...
0.10*cos(th2)+0.8*sin(th2),...
-0.25*cos(th2)+0.6*sin(th2),...
0.10*cos(th2)+0.4*sin(th2),...
-0.03*cos(th2)+0.33*sin(th2),...
-0.03*cos(th2)];

x03=0.5;
y03=3.5;
th3=0;

xres_31=x03+[0.40*sin(th3),0.40*sin(th3)+1.2*cos(th3),...
-0.40*sin(th3)+1.2*cos(th3),-0.40*sin(th3)];
yres_31=y03+[-0.40*cos(th3),-0.40*cos(th3)+1.2*sin(th3),...
0.40*cos(th3)+1.2*sin(th3),0.40*cos(th3)];

xres_32=x03+[-0.05*sin(th3),-0.05*sin(th3)+0.25*cos(th3),...
-0.40*sin(th3)+0.3*cos(th3),...
0.25*sin(th3)+0.45*cos(th3),...
-0.40*sin(th3)+0.6*cos(th3),...
0.25*sin(th3)+0.75*cos(th3),...
-0.40*sin(th3)+0.9*cos(th3),...
-0.05*sin(th3)+0.95*cos(th3),...
-0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+0.95*cos(th3),...
-0.25*sin(th3)+0.9*cos(th3),...
0.40*sin(th3)+0.75*cos(th3),...
-0.25*sin(th3)+0.6*cos(th3),...
0.40*sin(th3)+0.45*cos(th3),...
-0.25*sin(th3)+0.3*cos(th3),...
0.05*sin(th3)+0.25*cos(th3),...
0.05*sin(th3)];
yres_32=y03+[0.05*cos(th3),0.05*cos(th3)+0.25*sin(th3),...
0.40*cos(th3)+0.3*sin(th3),...
-0.25*cos(th3)+0.45*sin(th3),...
0.40*cos(th3)+0.6*sin(th3),...
-0.25*cos(th3)+0.75*sin(th3),...
0.40*cos(th3)+0.9*sin(th3),...
0.05*cos(th3)+0.95*sin(th3),...
0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+0.95*sin(th3),...
0.25*cos(th3)+0.9*sin(th3),...
-0.40*cos(th3)+0.75*sin(th3),...
0.25*cos(th3)+0.6*sin(th3),...
-0.40*cos(th3)+0.45*sin(th3),...
0.25*cos(th3)+0.3*sin(th3),...
-0.05*cos(th3)+0.25*sin(th3),...
-0.05*cos(th3)];

x04=4.0;

```

```

y04=-1.5;
th4=pi/2;

xres_41=x04+[0.25*sin(th4),0.25*sin(th4)+1.6*cos(th4),...
-0.25*sin(th4)+1.6*cos(th4),-0.25*sin(th4)];
yres_41=y04+[-0.25*cos(th4),-0.25*cos(th4)+1.6*sin(th4),...
0.25*cos(th4)+1.6*sin(th4),0.25*cos(th4)];

xres_42=x04+[-0.03*sin(th4),-0.03*sin(th4)+0.33*cos(th4),...
-0.25*sin(th4)+0.4*cos(th4),...
0.10*sin(th4)+0.6*cos(th4),...
-0.25*sin(th4)+0.8*cos(th4),...
0.10*sin(th4)+1.0*cos(th4),...
-0.25*sin(th4)+1.2*cos(th4),...
-0.03*sin(th4)+1.27*cos(th4),...
-0.03*sin(th4)+1.6*cos(th4),...
0.03*sin(th4)+1.6*cos(th4),...
0.03*sin(th4)+1.27*cos(th4),...
-0.10*sin(th4)+1.2*cos(th4),...
0.25*sin(th4)+1.0*cos(th4),...
-0.10*sin(th4)+0.8*cos(th4),...
0.25*sin(th4)+0.6*cos(th4),...
-0.10*sin(th4)+0.4*cos(th4),...
0.03*sin(th4)+0.33*cos(th4),...
0.03*sin(th4)];
yres_42=y04+[0.03*cos(th4),0.03*cos(th4)+0.33*sin(th4),...
0.25*cos(th4)+0.4*sin(th4),...
-0.10*cos(th4)+0.6*sin(th4),...
0.25*cos(th4)+0.8*sin(th4),...
-0.10*cos(th4)+1.0*sin(th4),...
0.25*cos(th4)+1.2*sin(th4),...
0.03*cos(th4)+1.27*sin(th4),...
0.03*cos(th4)+1.6*sin(th4),...
-0.03*cos(th4)+1.6*sin(th4),...
-0.03*cos(th4)+1.27*sin(th4),...
0.10*cos(th4)+1.2*sin(th4),...
-0.25*cos(th4)+1.0*sin(th4),...
0.10*cos(th4)+0.8*sin(th4),...
-0.25*cos(th4)+0.6*sin(th4),...
0.10*cos(th4)+0.4*sin(th4),...
-0.03*cos(th4)+0.33*sin(th4),...
-0.03*cos(th4)];

x05=6.5;
y05=3.5;
th5=0;

xres_51=x05+[0.40*sin(th5),0.40*sin(th5)+1.2*cos(th5),...
-0.40*sin(th5)+1.2*cos(th5),-0.40*sin(th5)];
yres_51=y05+[-0.40*cos(th5),-0.40*cos(th5)+1.2*sin(th5),...
0.40*cos(th5)+1.2*sin(th5),0.40*cos(th5)];

xres_52=x05+[-0.05*sin(th5),-0.05*sin(th5)+0.25*cos(th5),...
-0.40*sin(th5)+0.3*cos(th5),...
0.25*sin(th5)+0.45*cos(th5),...
-0.40*sin(th5)+0.6*cos(th5),...
0.25*sin(th5)+0.75*cos(th5),...
-0.40*sin(th5)+0.9*cos(th5),...
-0.05*sin(th5)+0.95*cos(th5),...
-0.05*sin(th5)+1.2*cos(th5),...
0.05*sin(th5)+1.2*cos(th5),...
0.05*sin(th5)+0.95*cos(th5),...
-0.25*sin(th5)+0.9*cos(th5),...
0.40*sin(th5)+0.75*cos(th5),...
-0.25*sin(th5)+0.6*cos(th5),...
0.40*sin(th5)+0.45*cos(th5),...
-0.25*sin(th5)+0.3*cos(th5),...
0.05*sin(th5)+0.25*cos(th5),...
0.05*sin(th5)];
yres_52=y05+[0.05*cos(th5),0.05*cos(th5)+0.25*sin(th5),...
0.40*cos(th5)+0.3*sin(th5),...
-0.25*cos(th5)+0.45*sin(th5),...
0.40*cos(th5)+0.6*sin(th5),...
-0.250*cos(th5)+0.75*sin(th5),...
0.40*cos(th5)+0.9*sin(th5),...
0.05*cos(th5)+0.95*sin(th5),...
0.05*cos(th5)+1.2*sin(th5),...
-0.05*cos(th5)+1.2*sin(th5),...
-0.05*cos(th5)+0.95*sin(th5),...
0.25*cos(th5)+0.9*sin(th5),...

```

```

-0.40*cos(th5)+0.75*sin(th5),...
0.25*cos(th5)+0.6*sin(th5),...
-0.40*cos(th5)+0.45*sin(th5),...
0.25*cos(th5)+0.3*sin(th5),...
-0.05*cos(th5)+0.25*sin(th5),...
-0.05*cos(th5)];

x06=-9.5;
y06=-0.5;

xV1_1=x06+[-1.0,1.0,1.0,-1.0];
yV1_1=y06+[-0.05,-0.05,0.05,0.05]+0.3;

xV1_2=x06+[-0.4,0.4,0.4,-0.4];
yV1_2=y06+[-0.1,-0.1,0.1,0.1]-0.1;

x07=9.5;
y07=-0.5;

xV2_1=x07+[-1.0,1.0,1.0,-1.0];
yV2_1=y07+[-0.05,-0.05,0.05,0.05]+0.3;

xV2_2=x07+[-0.4,0.4,0.4,-0.4];
yV2_2=y07+[-0.1,-0.1,0.1,0.1]-0.1;

x08=-5.0;
y08=-0.5;
phi8=0:0.01:2*pi;

xI1_1=x08+0.6*cos(phi8);
yI1_1=y08+0.9*sin(phi8);

xI1_2=x08+0.55*cos(phi8);
yI1_2=y08+0.85*sin(phi8);

xI1_3=x08+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI1_3=y08-[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

xcable1=[-9.5,-9.5,x01,x01];
ycable1=y01+[0.1,-0.1,-0.1,0.1];

xcable2=[-9.55,-9.45,-9.45,-9.55];
ycable2=[y01+0.1,y01+0.1,y06+0.35,y06+0.35];

xcable3=[-9.55,-9.45,-9.45,-9.55];
ycable3=[-6.0,-6.0,y06-0.2,y06-0.2];

xcable4=[-9.5,-9.5,9.5,9.5];
ycable4=[-6.0+[0.1,-0.1,-0.1,0.1];

xcable5=[9.55,9.45,9.45,9.55];
ycable5=[-6.0,-6.0,y07-0.2,y07-0.2];

xcable6=[9.55,9.45,9.45,9.55];
ycable6=[y01+0.1,y01+0.1,y07+0.35,y07+0.35];

xcable7=[9.5,9.5,x05+1.2,x05+1.2];
ycable7=y01+[0.1,-0.1,-0.1,0.1];

xcable8=[x05,x05,x03+1.2,x03+1.2];
ycable8=y01+[0.1,-0.1,-0.1,0.1];

xcable9=[x03,x03,x01+1.2,x01+1.2];
ycable9=y01+[0.1,-0.1,-0.1,0.1];

xcable10=x08+[-0.05,0.05,0.05,-0.05];
ycable10=[y01+0.1,y01+0.1,y08+0.9,y08+0.9];

xcable11=x08+[-0.05,0.05,0.05,-0.05];
ycable11=[-6.0,-6.0,y08-0.9,y08-0.9];

xcable12=x02+[-0.05,0.05,0.05,-0.05];
ycable12=[y01+0.1,y01+0.1,y02+1.6,y02+1.6];

xcable13=x02+[-0.05,0.05,0.05,-0.05];
ycable13=[-6.0,-6.0,y02,y02];

xcable14=x04+[-0.05,0.05,0.05,-0.05];

```

```

ycable14=[y01+0.1,y01+0.1,y04+1.6,y04+1.6];

xcable15=x04+[-0.05,0.05,0.05,-0.05];
ycable15=[-6.0,-6.0,y04,y04];

xcurr=2.5+[-3.95,-3.45,-3.45,-3.25,-3.45,-3.45,-3.95];
ycurr=y01+[0.1,0.1,0.3,0.0,-0.3,-0.1,-0.1];

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_11,yres_11,[1.0,1.0,1.0],...
xres_12,yres_12,[0.0,0.0,0.0],...
xres_21,yres_21,[1.0,1.0,1.0],...
xres_22,yres_22,[0.0,0.0,0.0],...
xres_31,yres_31,[1.0,1.0,1.0],...
xres_32,yres_32,[0.0,0.0,0.0],...
xres_41,yres_41,[1.0,1.0,1.0],...
xres_42,yres_42,[0.0,0.0,0.0],...
xres_51,yres_51,[1.0,1.0,1.0],...
xres_52,yres_52,[0.0,0.0,0.0],...
xV1_1,yV1_1,[0.0,0.0,0.0],...
xV1_2,yV1_2,[0.0,0.0,0.0],...
xV2_1,yV2_1,[0.0,0.0,0.0],...
xV2_2,yV2_2,[0.0,0.0,0.0],...
xI1_1,yI1_1,[0.0,0.0,0.0],...
xI1_2,yI1_2,[1.0,1.0,1.0],...
xI1_3,yI1_3,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
xcable10,ycable10,[0.8,0.6,0.2],...
xcable11,ycable11,[0.8,0.6,0.2],...
xcable12,ycable12,[0.8,0.6,0.2],...
xcable13,ycable13,[0.8,0.6,0.2],...
xcable14,ycable14,[0.8,0.6,0.2],...
xcable15,ycable15,[0.8,0.6,0.2],...
xcurr,ycurr,[0.0,0.0,0.0],...
'Linestyle','None')

text(-11,11,'Θεωρούμε αρχικά το ισοδύναμο κύκλωμα από τα άκρα a, b. Θα έχουμε')

text(x01+0.5,y01+1.0,'R_1','Color',[0.9,0.2,0.0])
text(x02+0.5,y02+0.8,'R_2','Color',[0.9,0.2,0.0])
text(x03+0.5,y03+1.0,'R_3','Color',[0.9,0.2,0.0])
text(x04+0.5,y04+0.8,'R_4','Color',[0.9,0.2,0.0])
text(x05+0.5,y05+1.0,'R_5','Color',[0.9,0.2,0.0])
text(-10.5,1.0,'V_1','Color',[0.0,0.2,0.9])
text(10.0,1.0,'V_2','Color',[0.0,0.2,0.9])
text(x08+0.7,y08,'J_1','Color',[0.0,0.4,0.4])
text(-1.2,y01+1.0,'I','Color',[0.0,0.0,0.0])
text(-2.6,4.3,'a','Color',[0.1,0.1,0.1])
text(-2.6,-6.7,'b','Color',[0.1,0.1,0.1])
text(x04-0.2,4.3,'c','Color',[0.1,0.1,0.1])
text(x04-0.2,-6.7,'d','Color',[0.1,0.1,0.1])

axis([-12,12,-12,12])
axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
elseif (snmeio==2)
axes(handles.axes1);
cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,9,9];

x01=-9.0;
y01=0;

```

```

        phil=0:0.01:2*pi;

        xI1_1=x01+0.6*cos(phil);
        yI1_1=y01+0.9*sin(phil);

        xI1_2=x01+0.55*cos(phil);
        yI1_2=y01+0.85*sin(phil);

        xI1_3=x01+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
        yI1_3=y01+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

        x02=-6.0;
        y02=-1.0;
        th2=pi/2;

        xres_21=x02+[0.25*sin(th2),0.25*sin(th2)+1.6*cos(th2),...
        -0.25*sin(th2)+1.6*cos(th2),-0.25*sin(th2)];
        yres_21=y02+[-0.25*cos(th2),-0.25*cos(th2)+1.6*sin(th2),...
        0.25*cos(th2)+1.6*sin(th2),0.25*cos(th2)];

        xres_22=x02+[-0.03*sin(th2),-0.03*sin(th2)+0.33*cos(th2),...
        -0.25*sin(th2)+0.4*cos(th2),...
        0.10*sin(th2)+0.6*cos(th2),...
        -0.25*sin(th2)+0.8*cos(th2),...
        0.10*sin(th2)+1.0*cos(th2),...
        -0.25*sin(th2)+1.2*cos(th2),...
        -0.03*sin(th2)+1.27*cos(th2),...
        -0.03*sin(th2)+1.6*cos(th2),...
        0.03*sin(th2)+1.6*cos(th2),...
        0.03*sin(th2)+1.27*cos(th2),...
        -0.10*sin(th2)+1.2*cos(th2),...
        0.25*sin(th2)+1.0*cos(th2),...
        -0.10*sin(th2)+0.8*cos(th2),...
        0.25*sin(th2)+0.6*cos(th2),...
        -0.10*sin(th2)+0.4*cos(th2),...
        0.03*sin(th2)+0.33*cos(th2),...
        0.03*sin(th2)];
        yres_22=y02+[0.03*cos(th2),0.03*cos(th2)+0.33*sin(th2),...
        0.25*cos(th2)+0.4*sin(th2),...
        -0.10*cos(th2)+0.6*sin(th2),...
        0.25*cos(th2)+0.8*sin(th2),...
        -0.10*cos(th2)+1.0*sin(th2),...
        0.25*cos(th2)+1.2*sin(th2),...
        0.03*cos(th2)+1.27*sin(th2),...
        0.03*cos(th2)+1.6*sin(th2),...
        -0.03*cos(th2)+1.6*sin(th2),...
        -0.03*cos(th2)+1.27*sin(th2),...
        0.10*cos(th2)+1.2*sin(th2),...
        -0.25*cos(th2)+1.0*sin(th2),...
        0.10*cos(th2)+0.8*sin(th2),...
        -0.25*cos(th2)+0.6*sin(th2),...
        0.10*cos(th2)+0.4*sin(th2),...
        -0.03*cos(th2)+0.33*sin(th2),...
        -0.03*cos(th2)];

        x03=-3.0;
        y03=-0.25;
        phi3=0:0.01:2*pi;

        xI2_1=x03+0.6*cos(phi3);
        yI2_1=y03+0.9*sin(phi3);

        xI2_2=x03+0.55*cos(phi3);
        yI2_2=y03+0.85*sin(phi3);

        xI2_3=x03+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
        yI2_3=y03-[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

        x04=0.0;
        y04=-1.0;
        th4=pi/2;

        xres_41=x04+[0.25*sin(th4),0.25*sin(th4)+1.6*cos(th4),...
        -0.25*sin(th4)+1.6*cos(th4),-0.25*sin(th4)];
        yres_41=y04+[-0.25*cos(th4),-0.25*cos(th4)+1.6*sin(th4),...
        0.25*cos(th4)+1.6*sin(th4),0.25*cos(th4)];

        xres_42=x04+[-0.03*sin(th4),-0.03*sin(th4)+0.33*cos(th4),...
        -0.25*sin(th4)+0.4*cos(th4),...

```



```

0.10*sin(th4)+0.6*cos(th4),...
-0.25*sin(th4)+0.8*cos(th4),...
0.10*sin(th4)+1.0*cos(th4),...
-0.25*sin(th4)+1.2*cos(th4),...
-0.03*sin(th4)+1.27*cos(th4),...
-0.03*sin(th4)+1.6*cos(th4),...
0.03*sin(th4)+1.6*cos(th4),...
0.03*sin(th4)+1.27*cos(th4),...
-0.10*sin(th4)+1.2*cos(th4),...
0.25*sin(th4)+1.0*cos(th4),...
-0.10*sin(th4)+0.8*cos(th4),...
0.25*sin(th4)+0.6*cos(th4),...
-0.10*sin(th4)+0.4*cos(th4),...
0.03*sin(th4)+0.33*cos(th4),...
0.03*sin(th4)];
yres_42=y04+[0.03*cos(th4),0.03*cos(th2)+0.33*sin(th2),...
0.25*cos(th4)+0.4*sin(th4),...
-0.10*cos(th4)+0.6*sin(th4),...
0.25*cos(th4)+0.8*sin(th4),...
-0.10*cos(th4)+1.0*sin(th4),...
0.25*cos(th4)+1.2*sin(th4),...
0.03*cos(th4)+1.27*sin(th4),...
0.03*cos(th4)+1.6*sin(th4),...
-0.03*cos(th4)+1.6*sin(th4),...
-0.03*cos(th4)+1.27*sin(th4),...
0.10*cos(th4)+1.2*sin(th4),...
-0.25*cos(th4)+1.0*sin(th4),...
0.10*cos(th4)+0.8*sin(th4),...
-0.25*cos(th4)+0.6*sin(th4),...
0.10*cos(th4)+0.4*sin(th4),...
-0.03*cos(th4)+0.33*sin(th4),...
-0.03*cos(th4)];

y05=3.5;

xcable1=[-9.0,-9.0,3.0,3.0];
ycable1=y05+[0.1,-0.1,-0.1,0.1];

xcable2=-9.0+[-0.05,0.05,0.05,-0.05];
ycable2=[y05+0.1,y05+0.1,y01+0.9,y01+0.9];

xcable3=-9.0+[-0.05,0.05,0.05,-0.05];
ycable3=[-4.0,-4.0,y01-0.9,y01-0.9];

xcable4=[-9.0,-9.0,3.0,3.0];
ycable4=-4.0+[0.1,-0.1,-0.1,0.1];

xcable5=x02+[-0.05,0.05,0.05,-0.05];
ycable5=[y05+0.1,y05+0.1,y02+1.6,y02+1.6];

xcable6=x02+[-0.05,0.05,0.05,-0.05];
ycable6=[-4.0,-4.0,y02,y02];

xcable7=x03+[-0.05,0.05,0.05,-0.05];
ycable7=[y05+0.1,y05+0.1,y03+0.9,y03+0.9];

xcable8=x03+[-0.05,0.05,0.05,-0.05];
ycable8=[-4.0,-4.0,y03-0.9,y03-0.9];

xcable9=x04+[-0.05,0.05,0.05,-0.05];
ycable9=[y05+0.1,y05+0.1,y04+1.6,y04+1.6];

xcable10=x04+[-0.05,0.05,0.05,-0.05];
ycable10=[-4.0,-4.0,y04,y04];

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xI1_1,yI1_1,[0.0,0.0,0.0],...
xI1_2,yI1_2,[1.0,1.0,1.0],...
xI1_3,yI1_3,[0.0,0.0,0.0],...
xres_21,yres_21,[1.0,1.0,1.0],...
xres_22,yres_22,[0.0,0.0,0.0],...
xI2_1,yI2_1,[0.0,0.0,0.0],...
xI2_2,yI2_2,[1.0,1.0,1.0],...
xI2_3,yI2_3,[0.0,0.0,0.0],...
xres_41,yres_41,[1.0,1.0,1.0],...
xres_42,yres_42,[0.0,0.0,0.0],...

```

```

xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
xcable10,ycable10,[0.8,0.6,0.2],...
    'Linestyle','None')

text(-11,11,'Αντικαταστήσαμε με το ισοδύναμο κατά Norton, το αριστερό άκρο του κυκλώματος. Θα είναι
    J_2)=(V_{1}/R_{1})=')
    text(7.5,11.2,nJ2)
    text(8.0,11.2,'A.')
text(-11,10,'Το κύκλωμα μετασχηματίζεται στο παρακάτω.')

    text(x01+0.7,y01,'J_2','Color',[0.0,0.4,0.4])
    text(x03+0.7,y03,'J_1','Color',[0.0,0.4,0.4])
    text(x02+0.5,y02+0.8,'R_1','Color',[0.9,0.2,0.0])
    text(x04+0.5,y04+0.8,'R_2','Color',[0.9,0.2,0.0])
    text(3.6,3.5,'a','Color',[0.1,0.1,0.1])
    text(3.6,-4.0,'b','Color',[0.1,0.1,0.1])

axis([-12,12,-12,12])
axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
elseif (snmeio==3)
axes(handles.axes1);
cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,9,9];

x01=-9.0;
y01=0;
phil=0:0.01:2*pi;

xI1_1=x01+0.6*cos(phil);
yI1_1=y01+0.9*sin(phil);

xI1_2=x01+0.55*cos(phil);
yI1_2=y01+0.85*sin(phil);

xI1_3=x01+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI1_3=y01+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

x02=-6.0;
y02=-1.0;
th2=pi/2;

xres_21=x02+[0.25*sin(th2),0.25*sin(th2)+1.6*cos(th2),...
-0.25*sin(th2)+1.6*cos(th2),-0.25*sin(th2)];
yres_21=y02+[-0.25*cos(th2),-0.25*cos(th2)+1.6*sin(th2),...
0.25*cos(th2)+1.6*sin(th2),0.25*cos(th2)];

xres_22=x02+[-0.03*sin(th2),-0.03*sin(th2)+0.33*cos(th2),...
-0.25*sin(th2)+0.4*cos(th2),...
0.10*sin(th2)+0.6*cos(th2),...
-0.25*sin(th2)+0.8*cos(th2),...
0.10*sin(th2)+1.0*cos(th2),...
-0.25*sin(th2)+1.2*cos(th2),...
-0.03*sin(th2)+1.27*cos(th2),...
-0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.27*cos(th2),...
-0.10*sin(th2)+1.2*cos(th2),...
0.25*sin(th2)+1.0*cos(th2),...
-0.10*sin(th2)+0.8*cos(th2),...
0.25*sin(th2)+0.6*cos(th2),...
-0.10*sin(th2)+0.4*cos(th2),...
0.03*sin(th2)+0.33*cos(th2),...

```

```

        0.03*sin(th2)];
yres_22=y02+[0.03*cos(th2),0.03*cos(th2)+0.33*sin(th2),...
    0.25*cos(th2)+0.4*sin(th2),...
    -0.10*cos(th2)+0.6*sin(th2),...
    0.25*cos(th2)+0.8*sin(th2),...
    -0.10*cos(th2)+1.0*sin(th2),...
    0.25*cos(th2)+1.2*sin(th2),...
    0.03*cos(th2)+1.27*sin(th2),...
    0.03*cos(th2)+1.6*sin(th2),...
    -0.03*cos(th2)+1.6*sin(th2),...
    -0.03*cos(th2)+1.27*sin(th2),...
    0.10*cos(th2)+1.2*sin(th2),...
    -0.25*cos(th2)+1.0*sin(th2),...
    0.10*cos(th2)+0.8*sin(th2),...
    -0.25*cos(th2)+0.6*sin(th2),...
    0.10*cos(th2)+0.4*sin(th2),...
    -0.03*cos(th2)+0.33*sin(th2),...
    -0.03*cos(th2)];

    x03=-3.0;
    y03=-0.25;
    phi3=0:0.01:2*pi;

    x04=0.0;
    y04=-1.0;
    th4=pi/2;

    y05=3.5;

    xcable1=[-9.0,-9.0,3.0,3.0];
    ycable1=y05+[0.1,-0.1,-0.1,0.1];

    xcable2=-9.0+[-0.05,0.05,0.05,-0.05];
    ycable2=[y05+0.1,y05+0.1,y01+0.9,y01+0.9];

    xcable3=-9.0+[-0.05,0.05,0.05,-0.05];
    ycable3=[-4.0,-4.0,y01-0.9,y01-0.9];

    xcable4=[-9.0,-9.0,3.0,3.0];
    ycable4=-4.0+[0.1,-0.1,-0.1,0.1];

    xcable5=x02+[-0.05,0.05,0.05,-0.05];
    ycable5=[y05+0.1,y05+0.1,y02+1.6,y02+1.6];

    xcable6=x02+[-0.05,0.05,0.05,-0.05];
    ycable6=[-4.0,-4.0,y02,y02];

    fill(x_back,y_back,[1.0,1.0,1.0],...
    x_tableau,y_tableau,[0.6,0.6,0.6],...
    xI1_1,yI1_1,[0.0,0.0,0.0],...
    xI1_2,yI1_2,[1.0,1.0,1.0],...
    xI1_3,yI1_3,[0.0,0.0,0.0],...
    xres_21,yres_21,[1.0,1.0,1.0],...
    xres_22,yres_22,[0.0,0.0,0.0],...
    xcable1,ycable1,[0.8,0.6,0.2],...
    xcable2,ycable2,[0.8,0.6,0.2],...
    xcable3,ycable3,[0.8,0.6,0.2],...
    xcable4,ycable4,[0.8,0.6,0.2],...
    xcable5,ycable5,[0.8,0.6,0.2],...
    xcable6,ycable6,[0.8,0.6,0.2],...
    'LineStyle','None')

    text(-11,11,'Θα εἰς(ναί J_{3})=J_{2}-J_{1}=')
        text(-7.5,11.2,nJ3)
    text(-7.2,11.0,'Α καί R_{12}=R_{1}R_{2}/(R_{1}+R_{2})=')
        text(-2.3,11.2,nR12)
text(-1.5,11.2,'Ohm. Απα το ισοδύναμο κατά Thevenin έχει R_{T1}=R_{12} καί ')
        text(-11,10,'V_{T1}=J_{3}R_{12}=')
        text(-8.5,10.2,nVT1)
        text(-7.5,10.2,'Volt.')
```

```

    text(x01+0.7,y01,'J_3','Color',[0.0,0.4,0.4])
    text(x02+0.5,y02+0.8,'R_{12}','Color',[0.9,0.2,0.0])
    text(3.6,3.5,'a','Color',[0.1,0.1,0.1])
    text(3.6,-4.0,'b','Color',[0.1,0.1,0.1])

    axis([-12,12,-12,12])
    axis off;

```

```

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
elseif (snmeio==4)
axes(handles.axes1);
cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,9,9];

x01=-8;
y01=3.5;
th1=0;

x02=-2.5;
y02=-1.5;
th2=pi/2;

x03=0.5;
y03=3.5;
th3=0;

x04=4.0;
y04=-1.5;
th4=pi/2;

xres_41=x04+[0.25*sin(th4),0.25*sin(th4)+1.6*cos(th4),...
-0.25*sin(th4)+1.6*cos(th4),-0.25*sin(th4)];
yres_41=y04+[-0.25*cos(th4),-0.25*cos(th4)+1.6*sin(th4),...
0.25*cos(th4)+1.6*sin(th4),0.25*cos(th4)];

xres_42=x04+[-0.03*sin(th4),-0.03*sin(th4)+0.33*cos(th4),...
-0.25*sin(th4)+0.4*cos(th4),...
0.10*sin(th4)+0.6*cos(th4),...
-0.25*sin(th4)+0.8*cos(th4),...
0.10*sin(th4)+1.0*cos(th4),...
-0.25*sin(th4)+1.2*cos(th4),...
-0.03*sin(th4)+1.27*cos(th4),...
-0.03*sin(th4)+1.6*cos(th4),...
0.03*sin(th4)+1.6*cos(th4),...
0.03*sin(th4)+1.27*cos(th4),...
-0.10*sin(th4)+1.2*cos(th4),...
0.25*sin(th4)+1.0*cos(th4),...
-0.10*sin(th4)+0.8*cos(th4),...
0.25*sin(th4)+0.6*cos(th4),...
-0.10*sin(th4)+0.4*cos(th4),...
0.03*sin(th4)+0.33*cos(th4),...
0.03*sin(th4)];
yres_42=y04+[0.03*cos(th4),0.03*cos(th4)+0.33*sin(th4),...
0.25*cos(th4)+0.4*sin(th4),...
-0.10*cos(th4)+0.6*sin(th4),...
0.25*cos(th4)+0.8*sin(th4),...
-0.10*cos(th4)+1.0*sin(th4),...
0.25*cos(th4)+1.2*sin(th4),...
0.03*cos(th4)+1.27*sin(th4),...
0.03*cos(th4)+1.6*sin(th4),...
-0.03*cos(th4)+1.6*sin(th4),...
-0.03*cos(th4)+1.27*sin(th4),...
0.10*cos(th4)+1.2*sin(th4),...
-0.25*cos(th4)+1.0*sin(th4),...
0.10*cos(th4)+0.8*sin(th4),...
-0.25*cos(th4)+0.6*sin(th4),...
0.10*cos(th4)+0.4*sin(th4),...
-0.03*cos(th4)+0.33*sin(th4),...
-0.03*cos(th4)];

x05=6.5;
y05=3.5;
th5=0;

xres_51=x05+[0.40*sin(th5),0.40*sin(th5)+1.2*cos(th5),...
-0.40*sin(th5)+1.2*cos(th5),-0.40*sin(th5)];
yres_51=y05+[-0.40*cos(th5),-0.40*cos(th5)+1.2*sin(th5),...
0.40*cos(th5)+1.2*sin(th5),0.40*cos(th5)];

xres_52=x05+[-0.05*sin(th5),-0.05*sin(th5)+0.25*cos(th5),...

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-0.40*sin(th5)+0.3*cos(th5),...
0.25*sin(th5)+0.45*cos(th5),...
-0.40*sin(th5)+0.6*cos(th5),...
0.25*sin(th5)+0.75*cos(th5),...
-0.40*sin(th5)+0.9*cos(th5),...
-0.05*sin(th5)+0.95*cos(th5),...
-0.05*sin(th5)+1.2*cos(th5),...
0.05*sin(th5)+1.2*cos(th5),...
0.05*sin(th5)+0.95*cos(th5),...
-0.25*sin(th5)+0.9*cos(th5),...
0.40*sin(th5)+0.75*cos(th5),...
-0.25*sin(th5)+0.6*cos(th5),...
0.40*sin(th5)+0.45*cos(th5),...
-0.25*sin(th5)+0.3*cos(th5),...
0.05*sin(th5)+0.25*cos(th5),...
0.05*sin(th5)];
yres_52=y05+[0.05*cos(th5),0.05*cos(th5)+0.25*sin(th5),...
0.40*cos(th5)+0.3*sin(th5),...
-0.25*cos(th5)+0.45*sin(th5),...
0.40*cos(th5)+0.6*sin(th5),...
-0.250*cos(th5)+0.75*sin(th5),...
0.40*cos(th5)+0.9*sin(th5),...
0.05*cos(th5)+0.95*sin(th5),...
0.05*cos(th5)+1.2*sin(th5),...
-0.05*cos(th5)+1.2*sin(th5),...
-0.05*cos(th5)+0.95*sin(th5),...
0.25*cos(th5)+0.9*sin(th5),...
-0.40*cos(th5)+0.75*sin(th5),...
0.25*cos(th5)+0.6*sin(th5),...
-0.40*cos(th5)+0.45*sin(th5),...
0.25*cos(th5)+0.3*sin(th5),...
-0.05*cos(th5)+0.25*sin(th5),...
-0.05*cos(th5)];

x06=-9.5;
y06=-0.5;

xV1_1=x06+[-1.0,1.0,1.0,-1.0];
yV1_1=y06+[-0.05,-0.05,0.05,0.05]+0.3;

xV1_2=x06+[-0.4,0.4,0.4,-0.4];
yV1_2=y06+[-0.1,-0.1,0.1,0.1]-0.1;

x07=9.5;
y07=-0.5;

xV2_1=x07+[-1.0,1.0,1.0,-1.0];
yV2_1=y07+[-0.05,-0.05,0.05,0.05]+0.3;

xV2_2=x07+[-0.4,0.4,0.4,-0.4];
yV2_2=y07+[-0.1,-0.1,0.1,0.1]-0.1;

x08=-5.0;
y08=-0.5;
phi8=0:0.01:2*pi;

xI1_1=x08+0.6*cos(phi8);
yI1_1=y08+0.9*sin(phi8);

xI1_2=x08+0.55*cos(phi8);
yI1_2=y08+0.85*sin(phi8);

xI1_3=x08+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI1_3=y08-[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

xcable4=[x03+1.2,x03+1.2,9.5,9.5];
ycable4=[-6.0+0.1,-0.1,-0.1,0.1];

xcable5=[9.55,9.45,9.45,9.55];
ycable5=[-6.0,-6.0,y07-0.2,y07-0.2];

xcable6=[9.55,9.45,9.45,9.55];
ycable6=[y01+0.1,y01+0.1,y07+0.35,y07+0.35];

xcable7=[9.5,9.5,x05+1.2,x05+1.2];
ycable7=[y01+0.1,-0.1,-0.1,0.1];

```

```

xcable8=[x05,x05,x03+1.2,x03+1.2];
ycable8=y01+[0.1,-0.1,-0.1,0.1];

xcable14=x04+[-0.05,0.05,0.05,-0.05];
ycable14=[y01+0.1,y01+0.1,y04+1.6,y04+1.6];

xcable15=x04+[-0.05,0.05,0.05,-0.05];
ycable15=[-6.0,-6.0,y04,y04];

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_41,yres_41,[1.0,1.0,1.0],...
xres_42,yres_42,[0.0,0.0,0.0],...
xres_51,yres_51,[1.0,1.0,1.0],...
xres_52,yres_52,[0.0,0.0,0.0],...
xV2_1,yV2_1,[0.0,0.0,0.0],...
xV2_2,yV2_2,[0.0,0.0,0.0],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable14,ycable14,[0.8,0.6,0.2],...
xcable15,ycable15,[0.8,0.6,0.2],...
'LineStyle','None')

text(-11,11,'Θεωρούμε το ισοδύναμο κύκλωμα από τα άκρα c, d. Θα έχουμε  $R_{\{T2\}}=R_{\{4\}}R_{\{5\}}/(R_{\{4\}}+R_{\{5\}})=$ ')
text(3.3,11.2,nRT2)
text(4.1,11.2,'Ohm,')
text(-11.0,10.0,'και  $V_{\{T2\}}=R_{\{4\}}V_{\{2\}}/(R_{\{4\}}+R_{\{5\}})=$ ')
text(-6.5,10.2,nVT2)
text(-5.6,10.2,'Volt')

text(x04+0.5,y04+0.8,'R_4','Color',[0.9,0.2,0.0])
text(x05+0.5,y05+1.0,'R_5','Color',[0.9,0.2,0.0])
text(10.0,1.0,'V_2','Color',[0.0,0.2,0.9])
text(x03+1.0,4.3,'c','Color',[0.1,0.1,0.1])
text(x03+1.0,-6.7,'d','Color',[0.1,0.1,0.1])

axis([-12,12,-12,12])
axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
elseif (snmeio==5)
axes(handles.axes1);
cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,9,9];

x01=-8;
y01=3.5;
th1=0;

xres_11=x01+[0.40*sin(th1),0.40*sin(th1)+1.2*cos(th1),...
-0.40*sin(th1)+1.2*cos(th1),-0.40*sin(th1)];
yres_11=y01+[-0.40*cos(th1),-0.40*cos(th1)+1.2*sin(th1),...
0.40*cos(th1)+1.2*sin(th1),0.40*cos(th1)];

xres_12=x01+[-0.05*sin(th1),-0.05*sin(th1)+0.25*cos(th1),...
-0.40*sin(th1)+0.3*cos(th1),...
0.25*sin(th1)+0.45*cos(th1),...
-0.40*sin(th1)+0.6*cos(th1),...
0.25*sin(th1)+0.75*cos(th1),...
-0.40*sin(th1)+0.9*cos(th1),...
-0.05*sin(th1)+0.95*cos(th1),...
-0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+0.95*cos(th1),...
-0.25*sin(th1)+0.9*cos(th1),...
0.40*sin(th1)+0.75*cos(th1),...
-0.25*sin(th1)+0.6*cos(th1),...
0.40*sin(th1)+0.45*cos(th1),...
-0.25*sin(th1)+0.3*cos(th1),...

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0.05*sin(th1)+0.25*cos(th1),...
0.05*sin(th1)];
yres_12=y01+[0.05*cos(th1),0.05*cos(th1)+0.25*sin(th1),...
0.40*cos(th1)+0.3*sin(th1),...
-0.25*cos(th1)+0.45*sin(th1),...
0.40*cos(th1)+0.6*sin(th1),...
-0.250*cos(th1)+0.75*sin(th1),...
0.40*cos(th1)+0.9*sin(th1),...
0.05*cos(th1)+0.95*sin(th1),...
0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+0.95*sin(th1),...
0.25*cos(th1)+0.9*sin(th1),...
-0.40*cos(th1)+0.75*sin(th1),...
0.25*cos(th1)+0.6*sin(th1),...
-0.40*cos(th1)+0.45*sin(th1),...
0.25*cos(th1)+0.3*sin(th1),...
-0.05*cos(th1)+0.25*sin(th1),...
-0.05*cos(th1)];

x02=-2.5;
y02=-1.5;
th2=pi/2;

x03=0.5;
y03=3.5;
th3=0;

xres_31=x03+[0.40*sin(th3),0.40*sin(th3)+1.2*cos(th3),...
-0.40*sin(th3)+1.2*cos(th3),-0.40*sin(th3)];
yres_31=y03+[-0.40*cos(th3),-0.40*cos(th3)+1.2*sin(th3),...
0.40*cos(th3)+1.2*sin(th3),0.40*cos(th3)];

xres_32=x03+[-0.05*sin(th3),-0.05*sin(th3)+0.25*cos(th3),...
-0.40*sin(th3)+0.3*cos(th3),...
0.25*sin(th3)+0.45*cos(th3),...
-0.40*sin(th3)+0.6*cos(th3),...
0.25*sin(th3)+0.75*cos(th3),...
-0.40*sin(th3)+0.9*cos(th3),...
-0.05*sin(th3)+0.95*cos(th3),...
-0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+0.95*cos(th3),...
-0.25*sin(th3)+0.9*cos(th3),...
0.40*sin(th3)+0.75*cos(th3),...
-0.25*sin(th3)+0.6*cos(th3),...
0.40*sin(th3)+0.45*cos(th3),...
-0.25*sin(th3)+0.3*cos(th3),...
0.05*sin(th3)+0.25*cos(th3),...
0.05*sin(th3)];
yres_32=y03+[0.05*cos(th3),0.05*cos(th3)+0.25*sin(th3),...
0.40*cos(th3)+0.3*sin(th3),...
-0.25*cos(th3)+0.45*sin(th3),...
0.40*cos(th3)+0.6*sin(th3),...
-0.250*cos(th3)+0.75*sin(th3),...
0.40*cos(th3)+0.9*sin(th3),...
0.05*cos(th3)+0.95*sin(th3),...
0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+0.95*sin(th3),...
0.25*cos(th3)+0.9*sin(th3),...
-0.40*cos(th3)+0.75*sin(th3),...
0.25*cos(th3)+0.6*sin(th3),...
-0.40*cos(th3)+0.45*sin(th3),...
0.25*cos(th3)+0.3*sin(th3),...
-0.05*cos(th3)+0.25*sin(th3),...
-0.05*cos(th3)];

x04=4.0;
y04=-1.5;
th4=pi/2;

x05=6.5;
y05=3.5;
th5=0;

xres_51=x05+[0.40*sin(th5),0.40*sin(th5)+1.2*cos(th5),...
-0.40*sin(th5)+1.2*cos(th5),-0.40*sin(th5)];
yres_51=y05+[-0.40*cos(th5),-0.40*cos(th5)+1.2*sin(th5),...
0.40*cos(th5)+1.2*sin(th5),0.40*cos(th5)];

```

```

xres_52=x05+[-0.05*sin(th5),-0.05*sin(th5)+0.25*cos(th5),...
-0.40*sin(th5)+0.3*cos(th5),...
0.25*sin(th5)+0.45*cos(th5),...
-0.40*sin(th5)+0.6*cos(th5),...
0.25*sin(th5)+0.75*cos(th5),...
-0.40*sin(th5)+0.9*cos(th5),...
-0.05*sin(th5)+0.95*cos(th5),...
-0.05*sin(th5)+1.2*cos(th5),...
0.05*sin(th5)+1.2*cos(th5),...
0.05*sin(th5)+0.95*cos(th5),...
-0.25*sin(th5)+0.9*cos(th5),...
0.40*sin(th5)+0.75*cos(th5),...
-0.25*sin(th5)+0.6*cos(th5),...
0.40*sin(th5)+0.45*cos(th5),...
-0.25*sin(th5)+0.3*cos(th5),...
0.05*sin(th5)+0.25*cos(th5),...
0.05*sin(th5)];
yres_52=y05+[0.05*cos(th5),0.05*cos(th5)+0.25*sin(th5),...
0.40*cos(th5)+0.3*sin(th5),...
-0.25*cos(th5)+0.45*sin(th5),...
0.40*cos(th5)+0.6*sin(th5),...
-0.250*cos(th5)+0.75*sin(th5),...
0.40*cos(th5)+0.9*sin(th5),...
0.05*cos(th5)+0.95*sin(th5),...
0.05*cos(th5)+1.2*sin(th5),...
-0.05*cos(th5)+1.2*sin(th5),...
-0.05*cos(th5)+0.95*sin(th5),...
0.25*cos(th5)+0.9*sin(th5),...
-0.40*cos(th5)+0.75*sin(th5),...
0.25*cos(th5)+0.6*sin(th5),...
-0.40*cos(th5)+0.45*sin(th5),...
0.25*cos(th5)+0.3*sin(th5),...
-0.05*cos(th5)+0.25*sin(th5),...
-0.05*cos(th5)];

x06=-9.5;
y06=-0.5;

xv1_1=x06+[-1.0,1.0,1.0,-1.0];
yv1_1=y06+[-0.05,-0.05,0.05,0.05]+0.3;

xv1_2=x06+[-0.4,0.4,0.4,-0.4];
yv1_2=y06+[-0.1,-0.1,0.1,0.1]-0.1;

x07=9.5;
y07=-0.5;

xv2_1=x07+[-1.0,1.0,1.0,-1.0];
yv2_1=y07+[-0.05,-0.05,0.05,0.05]+0.3;

xv2_2=x07+[-0.4,0.4,0.4,-0.4];
yv2_2=y07+[-0.1,-0.1,0.1,0.1]-0.1;

x08=-5.0;
y08=-0.5;
phi8=0:0.01:2*pi;

xcable1=[-9.5,-9.5,x01,x01];
ycable1=y01+[0.1,-0.1,-0.1,0.1];

xcable2=[-9.55,-9.45,-9.45,-9.55];
ycable2=[y01+0.1,y01+0.1,y06+0.35,y06+0.35];

xcable3=[-9.55,-9.45,-9.45,-9.55];
ycable3=[-6.0,-6.0,y06-0.2,y06-0.2];

xcable4=[-9.5,-9.5,9.5,9.5];
ycable4=-6.0+[0.1,-0.1,-0.1,0.1];

xcable5=[9.55,9.45,9.45,9.55];
ycable5=[-6.0,-6.0,y07-0.2,y07-0.2];

xcable6=[9.55,9.45,9.45,9.55];
ycable6=[y01+0.1,y01+0.1,y07+0.35,y07+0.35];

xcable7=[9.5,9.5,x05+1.2,x05+1.2];
ycable7=y01+[0.1,-0.1,-0.1,0.1];

```



```

xcable8=[x05,x05,x03+1.2,x03+1.2];
ycable8=y01+[0.1,-0.1,-0.1,0.1];

xcable9=[x03,x03,x01+1.2,x01+1.2];
ycable9=y01+[0.1,-0.1,-0.1,0.1];

xcable10=x08+[-0.05,0.05,0.05,-0.05];
ycable10=[y01+0.1,y01+0.1,y08+0.9,y08+0.9];

xcable11=x08+[-0.05,0.05,0.05,-0.05];
ycable11=[-6.0,-6.0,y08-0.9,y08-0.9];

xcable12=x02+[-0.05,0.05,0.05,-0.05];
ycable12=[y01+0.1,y01+0.1,y02+1.6,y02+1.6];

xcable13=x02+[-0.05,0.05,0.05,-0.05];
ycable13=[-6.0,-6.0,y02,y02];

xcable14=x04+[-0.05,0.05,0.05,-0.05];
ycable14=[y01+0.1,y01+0.1,y04+1.6,y04+1.6];

xcable15=x04+[-0.05,0.05,0.05,-0.05];
ycable15=[-6.0,-6.0,y04,y04];

xcurr=2.5+[-3.95,-3.45,-3.45,-3.25,-3.45,-3.45,-3.95];
ycurr=y01+[0.1,0.1,0.3,0.0,-0.3,-0.1,-0.1];

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_11,yres_11,[1.0,1.0,1.0],...
xres_12,yres_12,[0.0,0.0,0.0],...
xres_31,yres_31,[1.0,1.0,1.0],...
xres_32,yres_32,[0.0,0.0,0.0],...
xres_51,yres_51,[1.0,1.0,1.0],...
xres_52,yres_52,[0.0,0.0,0.0],...
xV1_1,yV1_1,[0.0,0.0,0.0],...
xV1_2,yV1_2,[0.0,0.0,0.0],...
xV2_1,yV2_1,[0.0,0.0,0.0],...
xV2_2,yV2_2,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
xcurr,ycurr,[0.0,0.0,0.0],...
'Linestyle','None')

text(-11,11,'Το αρχικό κύκλωμα γίνεται τώρα όπως παρακάτω. Θα είναι  $V_{\{T1\}}-I(R_{\{T1\}}+R_{\{3\}}+R_{\{T2\}})-V_{\{T2\}}=0'$ )
text(-11,10,'οπότε  $I=$ ')
text(-9.5,10.0,nI)
text(-8.8,10.0,'A.')

text(x01+0.5,y01+1.0,'R_{T1}','Color',[0.9,0.2,0.0])
text(x03+0.5,y03+1.0,'R_3','Color',[0.9,0.2,0.0])
text(x05+0.5,y05+1.0,'R_{T2}','Color',[0.9,0.2,0.0])
text(-10.5,1.0,'V_{T1}','Color',[0.0,0.2,0.9])
text(10.0,1.0,'V_{T2}','Color',[0.0,0.2,0.9])
text(-1.2,y01+1.0,'I','Color',[0.0,0.0,0.0])
text(-2.6,4.3,'a','Color',[0.1,0.1,0.1])
text(-2.6,-6.7,'b','Color',[0.1,0.1,0.1])
text(x04-0.2,4.3,'c','Color',[0.1,0.1,0.1])
text(x04-0.2,-6.7,'d','Color',[0.1,0.1,0.1])

axis([-12,12,-12,12])
axis off;

*****
else
end
*****
*****

```

```

% --- Executes on button press in pushbutton3.
function pushbutton3_Callback(hObject, eventdata, handles)
% hObject handle to pushbutton3 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
global R1;
global R2;
global R3;
global R4;
global R5;
global V1;
global V2;
global J1;

global snmeio;

snmeio=snmeio-1;

if (snmeio==0)
    snmeio=5;
end

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
J2=V1/R1;
nJ2=num2str(0.01*round(100*J2));
J3=J2-J1;
nJ3=num2str(0.01*round(100*J3));
R12=R1*R2/(R1+R2);
RT1=R12;
nR12=num2str(0.01*round(100*R12));
VT1=J3*R12;
nVT1=num2str(0.01*round(100*VT1));
RT2=R4*R5/(R4+R5);
nRT2=num2str(0.01*round(100*RT2));
VT2=R4*V2/(R4+R5);
nVT2=num2str(0.01*round(100*VT2));
I=(VT1-VT2)/(RT1+R3+RT2);
nI=num2str(0.01*round(100*I));
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
if (snmeio==1)
    axes(handles.axes1);
    cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
    x_back=[-12,12,12,-12];
    y_back=[-12,-12,12,12];

    x_tableau=[-11,11,11,-11];
    y_tableau=[-11,-11,9,9];

    x01=-8;
    y01=3.5;
    th1=0;

    xres_11=x01+[0.40*sin(th1),0.40*sin(th1)+1.2*cos(th1),...
        -0.40*sin(th1)+1.2*cos(th1),-0.40*sin(th1)];
    yres_11=y01+[-0.40*cos(th1),-0.40*cos(th1)+1.2*sin(th1),...
        0.40*cos(th1)+1.2*sin(th1),0.40*cos(th1)];

    xres_12=x01+[-0.05*sin(th1),-0.05*sin(th1)+0.25*cos(th1),...
        -0.40*sin(th1)+0.3*cos(th1),...
        0.25*sin(th1)+0.45*cos(th1),...
        -0.40*sin(th1)+0.6*cos(th1),...
        0.25*sin(th1)+0.75*cos(th1),...
        -0.40*sin(th1)+0.9*cos(th1),...
        -0.05*sin(th1)+0.95*cos(th1),...
        -0.05*sin(th1)+1.2*cos(th1),...
        0.05*sin(th1)+1.2*cos(th1),...
        0.05*sin(th1)+0.95*cos(th1),...
        -0.25*sin(th1)+0.9*cos(th1),...
        0.40*sin(th1)+0.75*cos(th1),...
        -0.25*sin(th1)+0.6*cos(th1),...
        0.40*sin(th1)+0.45*cos(th1),...
        -0.25*sin(th1)+0.3*cos(th1),...
        0.05*sin(th1)+0.25*cos(th1),...
        0.05*sin(th1)];
    yres_12=y01+[0.05*cos(th1),0.05*cos(th1)+0.25*sin(th1),...
        0.40*cos(th1)+0.3*sin(th1),...
        -0.25*cos(th1)+0.45*sin(th1),...

```

```

0.40*cos(th1)+0.6*sin(th1),...
-0.250*cos(th1)+0.75*sin(th1),...
0.40*cos(th1)+0.9*sin(th1),...
0.05*cos(th1)+0.95*sin(th1),...
0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+0.95*sin(th1),...
0.25*cos(th1)+0.9*sin(th1),...
-0.40*cos(th1)+0.75*sin(th1),...
0.25*cos(th1)+0.6*sin(th1),...
-0.40*cos(th1)+0.45*sin(th1),...
0.25*cos(th1)+0.3*sin(th1),...
-0.05*cos(th1)+0.25*sin(th1),...
-0.05*cos(th1)];

x02=-2.5;
y02=-1.5;
th2=pi/2;

xres_21=x02+[0.25*sin(th2),0.25*sin(th2)+1.6*cos(th2),...
-0.25*sin(th2)+1.6*cos(th2),-0.25*sin(th2)];
yres_21=y02+[-0.25*cos(th2),-0.25*cos(th2)+1.6*sin(th2),...
0.25*cos(th2)+1.6*sin(th2),0.25*cos(th2)];

xres_22=x02+[-0.03*sin(th2),-0.03*sin(th2)+0.33*cos(th2),...
-0.25*sin(th2)+0.4*cos(th2),...
0.10*sin(th2)+0.6*cos(th2),...
-0.25*sin(th2)+0.8*cos(th2),...
0.10*sin(th2)+1.0*cos(th2),...
-0.25*sin(th2)+1.2*cos(th2),...
-0.03*sin(th2)+1.27*cos(th2),...
-0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.27*cos(th2),...
-0.10*sin(th2)+1.2*cos(th2),...
0.25*sin(th2)+1.0*cos(th2),...
-0.10*sin(th2)+0.8*cos(th2),...
0.25*sin(th2)+0.6*cos(th2),...
-0.10*sin(th2)+0.4*cos(th2),...
0.03*sin(th2)+0.33*cos(th2),...
0.03*sin(th2)];
yres_22=y02+[0.03*cos(th2),0.03*cos(th2)+0.33*sin(th2),...
0.25*cos(th2)+0.4*sin(th2),...
-0.10*cos(th2)+0.6*sin(th2),...
0.25*cos(th2)+0.8*sin(th2),...
-0.10*cos(th2)+1.0*sin(th2),...
0.25*cos(th2)+1.2*sin(th2),...
0.03*cos(th2)+1.27*sin(th2),...
0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.27*sin(th2),...
0.10*cos(th2)+1.2*sin(th2),...
-0.25*cos(th2)+1.0*sin(th2),...
0.10*cos(th2)+0.8*sin(th2),...
-0.25*cos(th2)+0.6*sin(th2),...
0.10*cos(th2)+0.4*sin(th2),...
-0.03*cos(th2)+0.33*sin(th2),...
-0.03*cos(th2)];

x03=0.5;
y03=3.5;
th3=0;

xres_31=x03+[0.40*sin(th3),0.40*sin(th3)+1.2*cos(th3),...
-0.40*sin(th3)+1.2*cos(th3),-0.40*sin(th3)];
yres_31=y03+[-0.40*cos(th3),-0.40*cos(th3)+1.2*sin(th3),...
0.40*cos(th3)+1.2*sin(th3),0.40*cos(th3)];

xres_32=x03+[-0.05*sin(th3),-0.05*sin(th3)+0.25*cos(th3),...
-0.40*sin(th3)+0.3*cos(th3),...
0.25*sin(th3)+0.45*cos(th3),...
-0.40*sin(th3)+0.6*cos(th3),...
0.25*sin(th3)+0.75*cos(th3),...
-0.40*sin(th3)+0.9*cos(th3),...
-0.05*sin(th3)+0.95*cos(th3),...
-0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+0.95*cos(th3),...
-0.25*sin(th3)+0.9*cos(th3),...
0.40*sin(th3)+0.75*cos(th3),...

```

```

-0.25*sin(th3)+0.6*cos(th3),...
0.40*sin(th3)+0.45*cos(th3),...
-0.25*sin(th3)+0.3*cos(th3),...
0.05*sin(th3)+0.25*cos(th3),...
0.05*sin(th3)];
yres_32=y03+[0.05*cos(th3),0.05*cos(th3)+0.25*sin(th3),...
0.40*cos(th3)+0.3*sin(th3),...
-0.25*cos(th3)+0.45*sin(th3),...
0.40*cos(th3)+0.6*sin(th3),...
-0.250*cos(th3)+0.75*sin(th3),...
0.40*cos(th3)+0.9*sin(th3),...
0.05*cos(th3)+0.95*sin(th3),...
0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+0.95*sin(th3),...
0.25*cos(th3)+0.9*sin(th3),...
-0.40*cos(th3)+0.75*sin(th3),...
0.25*cos(th3)+0.6*sin(th3),...
-0.40*cos(th3)+0.45*sin(th3),...
0.25*cos(th3)+0.3*sin(th3),...
-0.05*cos(th3)+0.25*sin(th3),...
-0.05*cos(th3)];

x04=4.0;
y04=-1.5;
th4=pi/2;

xres_41=x04+[0.25*sin(th4),0.25*sin(th4)+1.6*cos(th4),...
-0.25*sin(th4)+1.6*cos(th4),-0.25*sin(th4)];
yres_41=y04+[-0.25*cos(th4),-0.25*cos(th4)+1.6*sin(th4),...
0.25*cos(th4)+1.6*sin(th4),0.25*cos(th4)];

xres_42=x04+[-0.03*sin(th4),-0.03*sin(th4)+0.33*cos(th4),...
-0.25*sin(th4)+0.4*cos(th4),...
0.10*sin(th4)+0.6*cos(th4),...
-0.25*sin(th4)+0.8*cos(th4),...
0.10*sin(th4)+1.0*cos(th4),...
-0.25*sin(th4)+1.2*cos(th4),...
-0.03*sin(th4)+1.27*cos(th4),...
-0.03*sin(th4)+1.6*cos(th4),...
0.03*sin(th4)+1.6*cos(th4),...
0.03*sin(th4)+1.27*cos(th4),...
-0.10*sin(th4)+1.2*cos(th4),...
0.25*sin(th4)+1.0*cos(th4),...
-0.10*sin(th4)+0.8*cos(th4),...
0.25*sin(th4)+0.6*cos(th4),...
-0.10*sin(th4)+0.4*cos(th4),...
0.03*sin(th4)+0.33*cos(th4),...
0.03*sin(th4)];
yres_42=y04+[0.03*cos(th4),0.03*cos(th4)+0.33*sin(th4),...
0.25*cos(th4)+0.4*sin(th4),...
-0.10*cos(th4)+0.6*sin(th4),...
0.25*cos(th4)+0.8*sin(th4),...
-0.10*cos(th4)+1.0*sin(th4),...
0.25*cos(th4)+1.2*sin(th4),...
0.03*cos(th4)+1.27*sin(th4),...
0.03*cos(th4)+1.6*sin(th4),...
-0.03*cos(th4)+1.6*sin(th4),...
-0.03*cos(th4)+1.27*sin(th4),...
0.10*cos(th4)+1.2*sin(th4),...
-0.25*cos(th4)+1.0*sin(th4),...
0.10*cos(th4)+0.8*sin(th4),...
-0.25*cos(th4)+0.6*sin(th4),...
0.10*cos(th4)+0.4*sin(th4),...
-0.03*cos(th4)+0.33*sin(th4),...
-0.03*cos(th4)];

x05=6.5;
y05=3.5;
th5=0;

xres_51=x05+[0.40*sin(th5),0.40*sin(th5)+1.2*cos(th5),...
-0.40*sin(th5)+1.2*cos(th5),-0.40*sin(th5)];
yres_51=y05+[-0.40*cos(th5),-0.40*cos(th5)+1.2*sin(th5),...
0.40*cos(th5)+1.2*sin(th5),0.40*cos(th5)];

xres_52=x05+[-0.05*sin(th5),-0.05*sin(th5)+0.25*cos(th5),...
-0.40*sin(th5)+0.3*cos(th5),...
0.25*sin(th5)+0.45*cos(th5),...
-0.40*sin(th5)+0.6*cos(th5),...

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0.25*sin(th5)+0.75*cos(th5),...
-0.40*sin(th5)+0.9*cos(th5),...
-0.05*sin(th5)+0.95*cos(th5),...
-0.05*sin(th5)+1.2*cos(th5),...
0.05*sin(th5)+1.2*cos(th5),...
0.05*sin(th5)+0.95*cos(th5),...
-0.25*sin(th5)+0.9*cos(th5),...
0.40*sin(th5)+0.75*cos(th5),...
-0.25*sin(th5)+0.6*cos(th5),...
0.40*sin(th5)+0.45*cos(th5),...
-0.25*sin(th5)+0.3*cos(th5),...
0.05*sin(th5)+0.25*cos(th5),...
0.05*sin(th5)];
yres_52=y05+[0.05*cos(th5),0.05*cos(th5)+0.25*sin(th5),...
0.40*cos(th5)+0.3*sin(th5),...
-0.25*cos(th5)+0.45*sin(th5),...
0.40*cos(th5)+0.6*sin(th5),...
-0.250*cos(th5)+0.75*sin(th5),...
0.40*cos(th5)+0.9*sin(th5),...
0.05*cos(th5)+0.95*sin(th5),...
0.05*cos(th5)+1.2*sin(th5),...
-0.05*cos(th5)+1.2*sin(th5),...
-0.05*cos(th5)+0.95*sin(th5),...
0.25*cos(th5)+0.9*sin(th5),...
-0.40*cos(th5)+0.75*sin(th5),...
0.25*cos(th5)+0.6*sin(th5),...
-0.40*cos(th5)+0.45*sin(th5),...
0.25*cos(th5)+0.3*sin(th5),...
-0.05*cos(th5)+0.25*sin(th5),...
-0.05*cos(th5)];

x06=-9.5;
y06=-0.5;

xV1_1=x06+[-1.0,1.0,1.0,-1.0];
yV1_1=y06+[-0.05,-0.05,0.05,0.05]+0.3;

xV1_2=x06+[-0.4,0.4,0.4,-0.4];
yV1_2=y06+[-0.1,-0.1,0.1,0.1]-0.1;

x07=9.5;
y07=-0.5;

xV2_1=x07+[-1.0,1.0,1.0,-1.0];
yV2_1=y07+[-0.05,-0.05,0.05,0.05]+0.3;

xV2_2=x07+[-0.4,0.4,0.4,-0.4];
yV2_2=y07+[-0.1,-0.1,0.1,0.1]-0.1;

x08=-5.0;
y08=-0.5;
phi8=0:0.01:2*pi;

xI1_1=x08+0.6*cos(phi8);
yI1_1=y08+0.9*sin(phi8);

xI1_2=x08+0.55*cos(phi8);
yI1_2=y08+0.85*sin(phi8);

xI1_3=x08+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI1_3=y08-[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

xcable1=[-9.5,-9.5,x01,x01];
ycable1=y01+[0.1,-0.1,-0.1,0.1];

xcable2=[-9.55,-9.45,-9.45,-9.55];
ycable2=[y01+0.1,y01+0.1,y06+0.35,y06+0.35];

xcable3=[-9.55,-9.45,-9.45,-9.55];
ycable3=[-6.0,-6.0,y06-0.2,y06-0.2];

xcable4=[-9.5,-9.5,9.5,9.5];
ycable4=-6.0+[0.1,-0.1,-0.1,0.1];

xcable5=[9.55,9.45,9.45,9.55];
ycable5=[-6.0,-6.0,y07-0.2,y07-0.2];

xcable6=[9.55,9.45,9.45,9.55];

```

```

ycable6=[y01+0.1,y01+0.1,y07+0.35,y07+0.35];

xcable7=[9.5,9.5,x05+1.2,x05+1.2];
ycable7=y01+[0.1,-0.1,-0.1,0.1];

xcable8=[x05,x05,x03+1.2,x03+1.2];
ycable8=y01+[0.1,-0.1,-0.1,0.1];

xcable9=[x03,x03,x01+1.2,x01+1.2];
ycable9=y01+[0.1,-0.1,-0.1,0.1];

xcable10=x08+[-0.05,0.05,0.05,-0.05];
ycable10=[y01+0.1,y01+0.1,y08+0.9,y08+0.9];

xcable11=x08+[-0.05,0.05,0.05,-0.05];
ycable11=[-6.0,-6.0,y08-0.9,y08-0.9];

xcable12=x02+[-0.05,0.05,0.05,-0.05];
ycable12=[y01+0.1,y01+0.1,y02+1.6,y02+1.6];

xcable13=x02+[-0.05,0.05,0.05,-0.05];
ycable13=[-6.0,-6.0,y02,y02];

xcable14=x04+[-0.05,0.05,0.05,-0.05];
ycable14=[y01+0.1,y01+0.1,y04+1.6,y04+1.6];

xcable15=x04+[-0.05,0.05,0.05,-0.05];
ycable15=[-6.0,-6.0,y04,y04];

xcurr=2.5+[-3.95,-3.45,-3.45,-3.25,-3.45,-3.45,-3.95];
ycurr=y01+[0.1,0.1,0.3,0.0,-0.3,-0.1,-0.1];

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_11,yres_11,[1.0,1.0,1.0],...
xres_12,yres_12,[0.0,0.0,0.0],...
xres_21,yres_21,[1.0,1.0,1.0],...
xres_22,yres_22,[0.0,0.0,0.0],...
xres_31,yres_31,[1.0,1.0,1.0],...
xres_32,yres_32,[0.0,0.0,0.0],...
xres_41,yres_41,[1.0,1.0,1.0],...
xres_42,yres_42,[0.0,0.0,0.0],...
xres_51,yres_51,[1.0,1.0,1.0],...
xres_52,yres_52,[0.0,0.0,0.0],...
xv1_1,yv1_1,[0.0,0.0,0.0],...
xv1_2,yv1_2,[0.0,0.0,0.0],...
xv2_1,yv2_1,[0.0,0.0,0.0],...
xv2_2,yv2_2,[0.0,0.0,0.0],...
xi1_1,yi1_1,[0.0,0.0,0.0],...
xi1_2,yi1_2,[1.0,1.0,1.0],...
xi1_3,yi1_3,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
xcable10,ycable10,[0.8,0.6,0.2],...
xcable11,ycable11,[0.8,0.6,0.2],...
xcable12,ycable12,[0.8,0.6,0.2],...
xcable13,ycable13,[0.8,0.6,0.2],...
xcable14,ycable14,[0.8,0.6,0.2],...
xcable15,ycable15,[0.8,0.6,0.2],...
xcurr,ycurr,[0.0,0.0,0.0],...
'Linestyle','None')

text(-11,11,'Θεωρούμε αρχικά το ισοδύναμο κύκλωμα από τα άκρα a, b. Θα έχουμε')

text(x01+0.5,y01+1.0,'R_1','Color',[0.9,0.2,0.0])
text(x02+0.5,y02+0.8,'R_2','Color',[0.9,0.2,0.0])
text(x03+0.5,y03+1.0,'R_3','Color',[0.9,0.2,0.0])
text(x04+0.5,y04+0.8,'R_4','Color',[0.9,0.2,0.0])
text(x05+0.5,y05+1.0,'R_5','Color',[0.9,0.2,0.0])
text(-10.5,1.0,'V_1','Color',[0.0,0.2,0.9])
text(10.0,1.0,'V_2','Color',[0.0,0.2,0.9])
text(x08+0.7,y08,'J_1','Color',[0.0,0.4,0.4])
text(-1.2,y01+1.0,'I','Color',[0.0,0.0,0.0])

```

```

text(-2.6,4.3,'a','Color',[0.1,0.1,0.1])
text(-2.6,-6.7,'b','Color',[0.1,0.1,0.1])
text(x04-0.2,4.3,'c','Color',[0.1,0.1,0.1])
text(x04-0.2,-6.7,'d','Color',[0.1,0.1,0.1])

axis([-12,12,-12,12])
axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
elseif (snmeio==2)
axes(handles.axes1);
cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,9,9];

x01=-9.0;
y01=0;
phi1=0:0.01:2*pi;

xI1_1=x01+0.6*cos(phi1);
yI1_1=y01+0.9*sin(phi1);

xI1_2=x01+0.55*cos(phi1);
yI1_2=y01+0.85*sin(phi1);

xI1_3=x01+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI1_3=y01+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

x02=-6.0;
y02=-1.0;
th2=pi/2;

xres_21=x02+[0.25*sin(th2),0.25*sin(th2)+1.6*cos(th2),...
-0.25*sin(th2)+1.6*cos(th2),-0.25*sin(th2)];
yres_21=y02+[-0.25*cos(th2),-0.25*cos(th2)+1.6*sin(th2),...
0.25*cos(th2)+1.6*sin(th2),0.25*cos(th2)];

xres_22=x02+[-0.03*sin(th2),-0.03*sin(th2)+0.33*cos(th2),...
-0.25*sin(th2)+0.4*cos(th2),...
0.10*sin(th2)+0.6*cos(th2),...
-0.25*sin(th2)+0.8*cos(th2),...
0.10*sin(th2)+1.0*cos(th2),...
-0.25*sin(th2)+1.2*cos(th2),...
-0.03*sin(th2)+1.27*cos(th2),...
-0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.27*cos(th2),...
-0.10*sin(th2)+1.2*cos(th2),...
0.25*sin(th2)+1.0*cos(th2),...
-0.10*sin(th2)+0.8*cos(th2),...
0.25*sin(th2)+0.6*cos(th2),...
-0.10*sin(th2)+0.4*cos(th2),...
0.03*sin(th2)+0.33*cos(th2),...
0.03*sin(th2)];
yres_22=y02+[0.03*cos(th2),0.03*cos(th2)+0.33*sin(th2),...
0.25*cos(th2)+0.4*sin(th2),...
-0.10*cos(th2)+0.6*sin(th2),...
0.25*cos(th2)+0.8*sin(th2),...
-0.10*cos(th2)+1.0*sin(th2),...
0.25*cos(th2)+1.2*sin(th2),...
0.03*cos(th2)+1.27*sin(th2),...
0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.27*sin(th2),...
0.10*cos(th2)+1.2*sin(th2),...
-0.25*cos(th2)+1.0*sin(th2),...
0.10*cos(th2)+0.8*sin(th2),...
-0.25*cos(th2)+0.6*sin(th2),...
0.10*cos(th2)+0.4*sin(th2),...
-0.03*cos(th2)+0.33*sin(th2),...
-0.03*cos(th2)];

x03=-3.0;

```

```

        y03=-0.25;
        phi3=0:0.01:2*pi;

        xI2_1=x03+0.6*cos(phi3);
        yI2_1=y03+0.9*sin(phi3);

        xI2_2=x03+0.55*cos(phi3);
        yI2_2=y03+0.85*sin(phi3);

        xI2_3=x03+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
        yI2_3=y03-[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

        x04=0.0;
        y04=-1.0;
        th4=pi/2;

        xres_41=x04+[0.25*sin(th4),0.25*sin(th4)+1.6*cos(th4),...
        -0.25*sin(th4)+1.6*cos(th4),-0.25*sin(th4)];
        yres_41=y04+[-0.25*cos(th4),-0.25*cos(th4)+1.6*sin(th4),...
        0.25*cos(th4)+1.6*sin(th4),0.25*cos(th4)];

        xres_42=x04+[-0.03*sin(th4),-0.03*sin(th4)+0.33*cos(th4),...
        -0.25*sin(th4)+0.4*cos(th4),...
        0.10*sin(th4)+0.6*cos(th4),...
        -0.25*sin(th4)+0.8*cos(th4),...
        0.10*sin(th4)+1.0*cos(th4),...
        -0.25*sin(th4)+1.2*cos(th4),...
        -0.03*sin(th4)+1.27*cos(th4),...
        -0.03*sin(th4)+1.6*cos(th4),...
        0.03*sin(th4)+1.6*cos(th4),...
        0.03*sin(th4)+1.27*cos(th4),...
        -0.10*sin(th4)+1.2*cos(th4),...
        0.25*sin(th4)+1.0*cos(th4),...
        -0.10*sin(th4)+0.8*cos(th4),...
        0.25*sin(th4)+0.6*cos(th4),...
        -0.10*sin(th4)+0.4*cos(th4),...
        0.03*sin(th4)+0.33*cos(th4),...
        0.03*sin(th4)];
        yres_42=y04+[0.03*cos(th4),0.03*cos(th2)+0.33*sin(th2),...
        0.25*cos(th4)+0.4*sin(th4),...
        -0.10*cos(th4)+0.6*sin(th4),...
        0.25*cos(th4)+0.8*sin(th4),...
        -0.10*cos(th4)+1.0*sin(th4),...
        0.25*cos(th4)+1.2*sin(th4),...
        0.03*cos(th4)+1.27*sin(th4),...
        0.03*cos(th4)+1.6*sin(th4),...
        -0.03*cos(th4)+1.6*sin(th4),...
        -0.03*cos(th4)+1.27*sin(th4),...
        0.10*cos(th4)+1.2*sin(th4),...
        -0.25*cos(th4)+1.0*sin(th4),...
        0.10*cos(th4)+0.8*sin(th4),...
        -0.25*cos(th4)+0.6*sin(th4),...
        0.10*cos(th4)+0.4*sin(th4),...
        -0.03*cos(th4)+0.33*sin(th4),...
        -0.03*cos(th4)];

        y05=3.5;

        xcable1=[-9.0,-9.0,3.0,3.0];
        ycable1=y05+[0.1,-0.1,-0.1,0.1];

        xcable2=-9.0+[-0.05,0.05,0.05,-0.05];
        ycable2=[y05+0.1,y05+0.1,y01+0.9,y01+0.9];

        xcable3=-9.0+[-0.05,0.05,0.05,-0.05];
        ycable3=[-4.0,-4.0,y01-0.9,y01-0.9];

        xcable4=[-9.0,-9.0,3.0,3.0];
        ycable4=-4.0+[0.1,-0.1,-0.1,0.1];

        xcable5=x02+[-0.05,0.05,0.05,-0.05];
        ycable5=[y05+0.1,y05+0.1,y02+1.6,y02+1.6];

        xcable6=x02+[-0.05,0.05,0.05,-0.05];
        ycable6=[-4.0,-4.0,y02,y02];

        xcable7=x03+[-0.05,0.05,0.05,-0.05];
        ycable7=[y05+0.1,y05+0.1,y03+0.9,y03+0.9];

        xcable8=x03+[-0.05,0.05,0.05,-0.05];

```



```

ycable8=[-4.0,-4.0,y03-0.9,y03-0.9];

xcable9=x04+[-0.05,0.05,0.05,-0.05];
ycable9=[y05+0.1,y05+0.1,y04+1.6,y04+1.6];

xcable10=x04+[-0.05,0.05,0.05,-0.05];
ycable10=[-4.0,-4.0,y04,y04];

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xI1_1,yI1_1,[0.0,0.0,0.0],...
xI1_2,yI1_2,[1.0,1.0,1.0],...
xI1_3,yI1_3,[0.0,0.0,0.0],...
xres_21,yres_21,[1.0,1.0,1.0],...
xres_22,yres_22,[0.0,0.0,0.0],...
xI2_1,yI2_1,[0.0,0.0,0.0],...
xI2_2,yI2_2,[1.0,1.0,1.0],...
xI2_3,yI2_3,[0.0,0.0,0.0],...
xres_41,yres_41,[1.0,1.0,1.0],...
xres_42,yres_42,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
xcable10,ycable10,[0.8,0.6,0.2],...
'Linestyle','None')

text(-11,11,'Αντικαταστήσαμε με το ισοδύναμο κατά Norton, το αριστερό άκρο του κυκλώματος. Θα είναι
J_2)=V_{1}/R_{1})=')
text(7.5,11.2,nJ2)
text(8.0,11.2,'A.')
text(-11,10,'Το κύκλωμα μετασχηματίζεται στο παρακάτω.')

text(x01+0.7,y01,'J_2','Color',[0.0,0.4,0.4])
text(x03+0.7,y03,'J_1','Color',[0.0,0.4,0.4])
text(x02+0.5,y02+0.8,'R_1','Color',[0.9,0.2,0.0])
text(x04+0.5,y04+0.8,'R_2','Color',[0.9,0.2,0.0])
text(3.6,3.5,'a','Color',[0.1,0.1,0.1])
text(3.6,-4.0,'b','Color',[0.1,0.1,0.1])

axis([-12,12,-12,12])
axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
elseif (snmeio==3)
axes(handles.axes1);
cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,9,9];

x01=-9.0;
y01=0;
phil=0:0.01:2*pi;

xI1_1=x01+0.6*cos(phil);
yI1_1=y01+0.9*sin(phil);

xI1_2=x01+0.55*cos(phil);
yI1_2=y01+0.85*sin(phil);

xI1_3=x01+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI1_3=y01+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

x02=-6.0;

```

```

y02=-1.0;
th2=pi/2;

xres_21=x02+[0.25*sin(th2),0.25*sin(th2)+1.6*cos(th2),...
-0.25*sin(th2)+1.6*cos(th2),-0.25*sin(th2)];
yres_21=y02+[-0.25*cos(th2),-0.25*cos(th2)+1.6*sin(th2),...
0.25*cos(th2)+1.6*sin(th2),0.25*cos(th2)];

xres_22=x02+[-0.03*sin(th2),-0.03*sin(th2)+0.33*cos(th2),...
-0.25*sin(th2)+0.4*cos(th2),...
0.10*sin(th2)+0.6*cos(th2),...
-0.25*sin(th2)+0.8*cos(th2),...
0.10*sin(th2)+1.0*cos(th2),...
-0.25*sin(th2)+1.2*cos(th2),...
-0.03*sin(th2)+1.27*cos(th2),...
-0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.6*cos(th2),...
0.03*sin(th2)+1.27*cos(th2),...
-0.10*sin(th2)+1.2*cos(th2),...
0.25*sin(th2)+1.0*cos(th2),...
-0.10*sin(th2)+0.8*cos(th2),...
0.25*sin(th2)+0.6*cos(th2),...
-0.10*sin(th2)+0.4*cos(th2),...
0.03*sin(th2)+0.33*cos(th2),...
0.03*sin(th2)];
yres_22=y02+[0.03*cos(th2),0.03*cos(th2)+0.33*sin(th2),...
0.25*cos(th2)+0.4*sin(th2),...
-0.10*cos(th2)+0.6*sin(th2),...
0.25*cos(th2)+0.8*sin(th2),...
-0.10*cos(th2)+1.0*sin(th2),...
0.25*cos(th2)+1.2*sin(th2),...
0.03*cos(th2)+1.27*sin(th2),...
0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.6*sin(th2),...
-0.03*cos(th2)+1.27*sin(th2),...
0.10*cos(th2)+1.2*sin(th2),...
-0.25*cos(th2)+1.0*sin(th2),...
0.10*cos(th2)+0.8*sin(th2),...
-0.25*cos(th2)+0.6*sin(th2),...
0.10*cos(th2)+0.4*sin(th2),...
-0.03*cos(th2)+0.33*sin(th2),...
-0.03*cos(th2)];

x03=-3.0;
y03=-0.25;
phi3=0:0.01:2*pi;

x04=0.0;
y04=-1.0;
th4=pi/2;

y05=3.5;

xcable1=[-9.0,-9.0,3.0,3.0];
ycable1=y05+[0.1,-0.1,-0.1,0.1];

xcable2=-9.0+[-0.05,0.05,0.05,-0.05];
ycable2=[y05+0.1,y05+0.1,y01+0.9,y01+0.9];

xcable3=-9.0+[-0.05,0.05,0.05,-0.05];
ycable3=[-4.0,-4.0,y01-0.9,y01-0.9];

xcable4=[-9.0,-9.0,3.0,3.0];
ycable4=-4.0+[0.1,-0.1,-0.1,0.1];

xcable5=x02+[-0.05,0.05,0.05,-0.05];
ycable5=[y05+0.1,y05+0.1,y02+1.6,y02+1.6];

xcable6=x02+[-0.05,0.05,0.05,-0.05];
ycable6=[-4.0,-4.0,y02,y02];

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xI1_1,yI1_1,[0.0,0.0,0.0],...
xI1_2,yI1_2,[1.0,1.0,1.0],...
xI1_3,yI1_3,[0.0,0.0,0.0],...
xres_21,yres_21,[1.0,1.0,1.0],...
xres_22,yres_22,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...

```

```

xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
    'LineStyle','None')

text(-11,11,'Θα είναι  $J_3=J_2-J_1$ =')
text(-7.5,11.2,nJ3)
text(-7.2,11.0,'Α και  $R_{12}=R_1R_2/(R_1+R_2)$ =')
text(-2.3,11.2,nR12)
text(-1.5,11.2,'Ohm. Άρα το ισοδύναμο κατά Thevenin έχει  $R_{T1}=R_{12}$  και ')
text(-11,10,' $V_{T1}=J_3R_{12}$ =')
text(-8.5,10.2,nVT1)
text(-7.5,10.2,'Volt.')

```

```

0.25*cos(th4)+1.2*sin(th4),...
0.03*cos(th4)+1.27*sin(th4),...
0.03*cos(th4)+1.6*sin(th4),...
-0.03*cos(th4)+1.6*sin(th4),...
-0.03*cos(th4)+1.27*sin(th4),...
0.10*cos(th4)+1.2*sin(th4),...
-0.25*cos(th4)+1.0*sin(th4),...
0.10*cos(th4)+0.8*sin(th4),...
-0.25*cos(th4)+0.6*sin(th4),...
0.10*cos(th4)+0.4*sin(th4),...
-0.03*cos(th4)+0.33*sin(th4),...
-0.03*cos(th4)];

x05=6.5;
y05=3.5;
th5=0;

xres_51=x05+[0.40*sin(th5),0.40*sin(th5)+1.2*cos(th5),...
-0.40*sin(th5)+1.2*cos(th5),-0.40*sin(th5)];
yres_51=y05+[-0.40*cos(th5),-0.40*cos(th5)+1.2*sin(th5),...
0.40*cos(th5)+1.2*sin(th5),0.40*cos(th5)];

xres_52=x05+[-0.05*sin(th5),-0.05*sin(th5)+0.25*cos(th5),...
-0.40*sin(th5)+0.3*cos(th5),...
0.25*sin(th5)+0.45*cos(th5),...
-0.40*sin(th5)+0.6*cos(th5),...
0.25*sin(th5)+0.75*cos(th5),...
-0.40*sin(th5)+0.9*cos(th5),...
-0.05*sin(th5)+0.95*cos(th5),...
-0.05*sin(th5)+1.2*cos(th5),...
0.05*sin(th5)+1.2*cos(th5),...
0.05*sin(th5)+0.95*cos(th5),...
-0.25*sin(th5)+0.9*cos(th5),...
0.40*sin(th5)+0.75*cos(th5),...
-0.25*sin(th5)+0.6*cos(th5),...
0.40*sin(th5)+0.45*cos(th5),...
-0.25*sin(th5)+0.3*cos(th5),...
0.05*sin(th5)+0.25*cos(th5),...
0.05*sin(th5)];
yres_52=y05+[0.05*cos(th5),0.05*cos(th5)+0.25*sin(th5),...
0.40*cos(th5)+0.3*sin(th5),...
-0.25*cos(th5)+0.45*sin(th5),...
0.40*cos(th5)+0.6*sin(th5),...
-0.25*cos(th5)+0.75*sin(th5),...
0.40*cos(th5)+0.9*sin(th5),...
0.05*cos(th5)+0.95*sin(th5),...
0.05*cos(th5)+1.2*sin(th5),...
-0.05*cos(th5)+1.2*sin(th5),...
-0.05*cos(th5)+0.95*sin(th5),...
0.25*cos(th5)+0.9*sin(th5),...
-0.40*cos(th5)+0.75*sin(th5),...
0.25*cos(th5)+0.6*sin(th5),...
-0.40*cos(th5)+0.45*sin(th5),...
0.25*cos(th5)+0.3*sin(th5),...
-0.05*cos(th5)+0.25*sin(th5),...
-0.05*cos(th5)];

x06=-9.5;
y06=-0.5;

xv1_1=x06+[-1.0,1.0,1.0,-1.0];
yv1_1=y06+[-0.05,-0.05,0.05,0.05]+0.3;

xv1_2=x06+[-0.4,0.4,0.4,-0.4];
yv1_2=y06+[-0.1,-0.1,0.1,0.1]-0.1;

x07=9.5;
y07=-0.5;

xv2_1=x07+[-1.0,1.0,1.0,-1.0];
yv2_1=y07+[-0.05,-0.05,0.05,0.05]+0.3;

xv2_2=x07+[-0.4,0.4,0.4,-0.4];
yv2_2=y07+[-0.1,-0.1,0.1,0.1]-0.1;

x08=-5.0;
y08=-0.5;
phi8=0:0.01:2*pi;

```

```

xI1_1=x08+0.6*cos(phi8);
yI1_1=y08+0.9*sin(phi8);

xI1_2=x08+0.55*cos(phi8);
yI1_2=y08+0.85*sin(phi8);

xI1_3=x08+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI1_3=y08-[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

xcable4=[x03+1.2,x03+1.2,9.5,9.5];
ycable4=[-6.0+[0.1,-0.1,-0.1,0.1];

xcable5=[9.55,9.45,9.45,9.55];
ycable5=[-6.0,-6.0,y07-0.2,y07-0.2];

xcable6=[9.55,9.45,9.45,9.55];
ycable6=[y01+0.1,y01+0.1,y07+0.35,y07+0.35];

xcable7=[9.5,9.5,x05+1.2,x05+1.2];
ycable7=y01+[0.1,-0.1,-0.1,0.1];

xcable8=[x05,x05,x03+1.2,x03+1.2];
ycable8=y01+[0.1,-0.1,-0.1,0.1];

xcable14=x04+[-0.05,0.05,0.05,-0.05];
ycable14=[y01+0.1,y01+0.1,y04+1.6,y04+1.6];

xcable15=x04+[-0.05,0.05,0.05,-0.05];
ycable15=[-6.0,-6.0,y04,y04];

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_41,yres_41,[1.0,1.0,1.0],...
xres_42,yres_42,[0.0,0.0,0.0],...
xres_51,yres_51,[1.0,1.0,1.0],...
xres_52,yres_52,[0.0,0.0,0.0],...
xV2_1,yV2_1,[0.0,0.0,0.0],...
xV2_2,yV2_2,[0.0,0.0,0.0],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable14,ycable14,[0.8,0.6,0.2],...
xcable15,ycable15,[0.8,0.6,0.2],...
'Linestyle','None')

text(-11,11,'Θεωρούμε το ισοδύναμο κύκλωμα από τα άκρα c, d. Θα έχουμε  $R_{\{T2\}}=R_{\{4\}}R_{\{5\}}/(R_{\{4\}}+R_{\{5\}})=$ ')
text(3.3,11.2,nRT2)
text(4.1,11.2,'Ohm,')
text(-11.0,10.0,'και  $V_{\{T2\}}=R_{\{4\}}V_{\{2\}}/(R_{\{4\}}+R_{\{5\}})=$ ')
text(-6.5,10.2,nVT2)
text(-5.6,10.2,'Volt')

text(x04+0.5,y04+0.8,'R_4','Color',[0.9,0.2,0.0])
text(x05+0.5,y05+1.0,'R_5','Color',[0.9,0.2,0.0])
text(10.0,1.0,'V_2','Color',[0.0,0.2,0.9])
text(x03+1.0,4.3,'c','Color',[0.1,0.1,0.1])
text(x03+1.0,-6.7,'d','Color',[0.1,0.1,0.1])

axis([-12,12,-12,12])
axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
elseif (snmeio==5)
axes(handles.axes1);
cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,9,9];

```

```

x01=-8;
y01=3.5;
th1=0;

xres_11=x01+[0.40*sin(th1),0.40*sin(th1)+1.2*cos(th1),...
-0.40*sin(th1)+1.2*cos(th1),-0.40*sin(th1)];
yres_11=y01+[-0.40*cos(th1),-0.40*cos(th1)+1.2*sin(th1),...
0.40*cos(th1)+1.2*sin(th1),0.40*cos(th1)];

xres_12=x01+[-0.05*sin(th1),-0.05*sin(th1)+0.25*cos(th1),...
-0.40*sin(th1)+0.3*cos(th1),...
0.25*sin(th1)+0.45*cos(th1),...
-0.40*sin(th1)+0.6*cos(th1),...
0.25*sin(th1)+0.75*cos(th1),...
-0.40*sin(th1)+0.9*cos(th1),...
-0.05*sin(th1)+0.95*cos(th1),...
-0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+0.95*cos(th1),...
-0.25*sin(th1)+0.9*cos(th1),...
0.40*sin(th1)+0.75*cos(th1),...
-0.25*sin(th1)+0.6*cos(th1),...
0.40*sin(th1)+0.45*cos(th1),...
-0.25*sin(th1)+0.3*cos(th1),...
0.05*sin(th1)+0.25*cos(th1),...
0.05*sin(th1)];
yres_12=y01+[0.05*cos(th1),0.05*cos(th1)+0.25*sin(th1),...
0.40*cos(th1)+0.3*sin(th1),...
-0.25*cos(th1)+0.45*sin(th1),...
0.40*cos(th1)+0.6*sin(th1),...
-0.250*cos(th1)+0.75*sin(th1),...
0.40*cos(th1)+0.9*sin(th1),...
0.05*cos(th1)+0.95*sin(th1),...
0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+0.95*sin(th1),...
0.25*cos(th1)+0.9*sin(th1),...
-0.40*cos(th1)+0.75*sin(th1),...
0.25*cos(th1)+0.6*sin(th1),...
-0.40*cos(th1)+0.45*sin(th1),...
0.25*cos(th1)+0.3*sin(th1),...
-0.05*cos(th1)+0.25*sin(th1),...
-0.05*cos(th1)];

x02=-2.5;
y02=-1.5;
th2=pi/2;

x03=0.5;
y03=3.5;
th3=0;

xres_31=x03+[0.40*sin(th3),0.40*sin(th3)+1.2*cos(th3),...
-0.40*sin(th3)+1.2*cos(th3),-0.40*sin(th3)];
yres_31=y03+[-0.40*cos(th3),-0.40*cos(th3)+1.2*sin(th3),...
0.40*cos(th3)+1.2*sin(th3),0.40*cos(th3)];

xres_32=x03+[-0.05*sin(th3),-0.05*sin(th3)+0.25*cos(th3),...
-0.40*sin(th3)+0.3*cos(th3),...
0.25*sin(th3)+0.45*cos(th3),...
-0.40*sin(th3)+0.6*cos(th3),...
0.25*sin(th3)+0.75*cos(th3),...
-0.40*sin(th3)+0.9*cos(th3),...
-0.05*sin(th3)+0.95*cos(th3),...
-0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+0.95*cos(th3),...
-0.25*sin(th3)+0.9*cos(th3),...
0.40*sin(th3)+0.75*cos(th3),...
-0.25*sin(th3)+0.6*cos(th3),...
0.40*sin(th3)+0.45*cos(th3),...
-0.25*sin(th3)+0.3*cos(th3),...
0.05*sin(th3)+0.25*cos(th3),...
0.05*sin(th3)];
yres_32=y03+[0.05*cos(th3),0.05*cos(th3)+0.25*sin(th3),...
0.40*cos(th3)+0.3*sin(th3),...
-0.25*cos(th3)+0.45*sin(th3),...
0.40*cos(th3)+0.6*sin(th3),...
-0.250*cos(th3)+0.75*sin(th3),...
0.40*cos(th3)+0.9*sin(th3),...
0.05*cos(th3)+0.95*sin(th3),...
0.05*cos(th3)];

```

```

0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+0.95*sin(th3),...
0.25*cos(th3)+0.9*sin(th3),...
-0.40*cos(th3)+0.75*sin(th3),...
0.25*cos(th3)+0.6*sin(th3),...
-0.40*cos(th3)+0.45*sin(th3),...
0.25*cos(th3)+0.3*sin(th3),...
-0.05*cos(th3)+0.25*sin(th3),...
-0.05*cos(th3)];

x04=4.0;
y04=-1.5;
th4=pi/2;

x05=6.5;
y05=3.5;
th5=0;

xres_51=x05+[0.40*sin(th5),0.40*sin(th5)+1.2*cos(th5),...
-0.40*sin(th5)+1.2*cos(th5),-0.40*sin(th5)];
yres_51=y05+[-0.40*cos(th5),-0.40*cos(th5)+1.2*sin(th5),...
0.40*cos(th5)+1.2*sin(th5),0.40*cos(th5)];

xres_52=x05+[-0.05*sin(th5),-0.05*sin(th5)+0.25*cos(th5),...
-0.40*sin(th5)+0.3*cos(th5),...
0.25*sin(th5)+0.45*cos(th5),...
-0.40*sin(th5)+0.6*cos(th5),...
0.25*sin(th5)+0.75*cos(th5),...
-0.40*sin(th5)+0.9*cos(th5),...
-0.05*sin(th5)+0.95*cos(th5),...
-0.05*sin(th5)+1.2*cos(th5),...
0.05*sin(th5)+1.2*cos(th5),...
0.05*sin(th5)+0.95*cos(th5),...
-0.25*sin(th5)+0.9*cos(th5),...
0.40*sin(th5)+0.75*cos(th5),...
-0.25*sin(th5)+0.6*cos(th5),...
0.40*sin(th5)+0.45*cos(th5),...
-0.25*sin(th5)+0.3*cos(th5),...
0.05*sin(th5)+0.25*cos(th5),...
0.05*sin(th5)];
yres_52=y05+[0.05*cos(th5),0.05*cos(th5)+0.25*sin(th5),...
0.40*cos(th5)+0.3*sin(th5),...
-0.25*cos(th5)+0.45*sin(th5),...
0.40*cos(th5)+0.6*sin(th5),...
-0.250*cos(th5)+0.75*sin(th5),...
0.40*cos(th5)+0.9*sin(th5),...
0.05*cos(th5)+0.95*sin(th5),...
0.05*cos(th5)+1.2*sin(th5),...
-0.05*cos(th5)+1.2*sin(th5),...
-0.05*cos(th5)+0.95*sin(th5),...
0.25*cos(th5)+0.9*sin(th5),...
-0.40*cos(th5)+0.75*sin(th5),...
0.25*cos(th5)+0.6*sin(th5),...
-0.40*cos(th5)+0.45*sin(th5),...
0.25*cos(th5)+0.3*sin(th5),...
-0.05*cos(th5)+0.25*sin(th5),...
-0.05*cos(th5)];

x06=-9.5;
y06=-0.5;

xv1_1=x06+[-1.0,1.0,1.0,-1.0];
yv1_1=y06+[-0.05,-0.05,0.05,0.05]+0.3;

xv1_2=x06+[-0.4,0.4,0.4,-0.4];
yv1_2=y06+[-0.1,-0.1,0.1,0.1]-0.1;

x07=9.5;
y07=-0.5;

xv2_1=x07+[-1.0,1.0,1.0,-1.0];
yv2_1=y07+[-0.05,-0.05,0.05,0.05]+0.3;

xv2_2=x07+[-0.4,0.4,0.4,-0.4];
yv2_2=y07+[-0.1,-0.1,0.1,0.1]-0.1;

x08=-5.0;

```

```

y08=-0.5;
phi8=0:0.01:2*pi;

xcable1=[-9.5,-9.5,x01,x01];
ycable1=y01+[0.1,-0.1,-0.1,0.1];

xcable2=[-9.55,-9.45,-9.45,-9.55];
ycable2=[y01+0.1,y01+0.1,y06+0.35,y06+0.35];

xcable3=[-9.55,-9.45,-9.45,-9.55];
ycable3=[-6.0,-6.0,y06-0.2,y06-0.2];

xcable4=[-9.5,-9.5,9.5,9.5];
ycable4=-6.0+[0.1,-0.1,-0.1,0.1];

xcable5=[9.55,9.45,9.45,9.55];
ycable5=[-6.0,-6.0,y07-0.2,y07-0.2];

xcable6=[9.55,9.45,9.45,9.55];
ycable6=[y01+0.1,y01+0.1,y07+0.35,y07+0.35];

xcable7=[9.5,9.5,x05+1.2,x05+1.2];
ycable7=y01+[0.1,-0.1,-0.1,0.1];

xcable8=[x05,x05,x03+1.2,x03+1.2];
ycable8=y01+[0.1,-0.1,-0.1,0.1];

xcable9=[x03,x03,x01+1.2,x01+1.2];
ycable9=y01+[0.1,-0.1,-0.1,0.1];

xcable10=x08+[-0.05,0.05,0.05,-0.05];
ycable10=[y01+0.1,y01+0.1,y08+0.9,y08+0.9];

xcable11=x08+[-0.05,0.05,0.05,-0.05];
ycable11=[-6.0,-6.0,y08-0.9,y08-0.9];

xcable12=x02+[-0.05,0.05,0.05,-0.05];
ycable12=[y01+0.1,y01+0.1,y02+1.6,y02+1.6];

xcable13=x02+[-0.05,0.05,0.05,-0.05];
ycable13=[-6.0,-6.0,y02,y02];

xcable14=x04+[-0.05,0.05,0.05,-0.05];
ycable14=[y01+0.1,y01+0.1,y04+1.6,y04+1.6];

xcable15=x04+[-0.05,0.05,0.05,-0.05];
ycable15=[-6.0,-6.0,y04,y04];

xcurr=2.5+[-3.95,-3.45,-3.45,-3.25,-3.45,-3.45,-3.95];
ycurr=y01+[0.1,0.1,0.3,0.0,-0.3,-0.1,-0.1];

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_11,yres_11,[1.0,1.0,1.0],...
xres_12,yres_12,[0.0,0.0,0.0],...
xres_31,yres_31,[1.0,1.0,1.0],...
xres_32,yres_32,[0.0,0.0,0.0],...
xres_51,yres_51,[1.0,1.0,1.0],...
xres_52,yres_52,[0.0,0.0,0.0],...
xV1_1,yV1_1,[0.0,0.0,0.0],...
xV1_2,yV1_2,[0.0,0.0,0.0],...
xV2_1,yV2_1,[0.0,0.0,0.0],...
xV2_2,yV2_2,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
xcurr,ycurr,[0.0,0.0,0.0],...
'Linestyle','None')

text(-11,11,'Το αρχικό κύκλωμα γίνεται τώρα όπως παρακάτω. Θα είναι  $V_{\{T1\}}-I(R_{\{T1\}}+R_{\{3\}}+R_{\{T2\}})-V_{\{T2\}}=0'$ )
text(-11,10,'οπότε  $I=$ ')
text(-9.5,10.0,nI)
text(-8.8,10.0,'A.')
```



```

text(x01+0.5,y01+1.0,'R_{T1}','Color',[0.9,0.2,0.0])
text(x03+0.5,y03+1.0,'R_3','Color',[0.9,0.2,0.0])
text(x05+0.5,y05+1.0,'R_{T2}','Color',[0.9,0.2,0.0])
text(-10.5,1.0,'V_{T1}','Color',[0.0,0.2,0.9])
text(10.0,1.0,'V_{T2}','Color',[0.0,0.2,0.9])
text(-1.2,y01+1.0,'I','Color',[0.0,0.0,0.0])
text(-2.6,4.3,'a','Color',[0.1,0.1,0.1])
text(-2.6,-6.7,'b','Color',[0.1,0.1,0.1])
text(x04-0.2,4.3,'c','Color',[0.1,0.1,0.1])
text(x04-0.2,-6.7,'d','Color',[0.1,0.1,0.1])

axis([-12,12,-12,12])
axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
else
end

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

% --- Executes on button press in pushbutton4.
function pushbutton4_Callback(hObject, eventdata, handles)
% hObject handle to pushbutton4 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)
hfin=questdlg('Εξοδος από το πρόγραμμα?');
switch hfin
case 'Yes'
closereq;
end

```

Ασκηση 8

```

function varargout = g_asknsn_8(varargin)
% G_ASKNSN_8 M-file for g_asknsn_8.fig
% G_ASKNSN_8, by itself, creates a new G_ASKNSN_8 or raises the existing
% singleton*.
%
% H = G_ASKNSN_8 returns the handle to a new G_ASKNSN_8 or the handle to
% the existing singleton*.
%
% G_ASKNSN_8('CALLBACK',hObject,eventData,handles,...) calls the local
% function named CALLBACK in G_ASKNSN_8.M with the given input arguments.
%
% G_ASKNSN_8('Property','Value',...) creates a new G_ASKNSN_8 or raises the
% existing singleton*. Starting from the left, property value pairs are
% applied to the GUI before g_asknsn_8_OpeningFcn gets called. An
% unrecognized property name or invalid value makes property application
% stop. All inputs are passed to g_asknsn_8_OpeningFcn via varargin.
%
% *See GUI Options on GUIDE's Tools menu. Choose "GUI allows only one
% instance to run (singleton)".
%
% See also: GUIDE, GUIDATA, GUIHANDLES

% Edit the above text to modify the response to help g_asknsn_8

% Last Modified by GUIDE v2.5 18-Dec-2013 23:23:07

% Begin initialization code - DO NOT EDIT
gui_Singleton = 1;
gui_State = struct('gui_Name', mfilename, ...
'gui_Singleton', gui_Singleton, ...
'gui_OpeningFcn', @g_asknsn_8_OpeningFcn, ...
'gui_OutputFcn', @g_asknsn_8_OutputFcn, ...
'gui_LayoutFcn', [], ...
'gui_Callback', []);
if nargin && ischar(varargin{1})
gui_State.gui_Callback = str2func(varargin{1});
end

```

```

        if nargout
[varargout{1:nargout}] = gui_mainfcn(gui_State, varargin{:});
        else
            gui_mainfcn(gui_State, varargin{:});
        end
    % End initialization code - DO NOT EDIT

    % --- Executes just before g_asknsn_8 is made visible.
function g_asknsn_8_OpeningFcn(hObject, eventdata, handles, varargin)
    % This function has no output args, see OutputFcn.
    % hObject    handle to figure
    % eventdata reserved - to be defined in a future version of MATLAB
    % handles    structure with handles and user data (see GUIDATA)
    % varargin   command line arguments to g_asknsn_8 (see VARARGIN)

    %*****

        x_back=[-12,12,12,-12];
        y_back=[-12,-12,12,12];

        x_tableau=[-11,11,11,-11];
        y_tableau=[-11,-11,9,9];

        x01=-6;
        y01=5.5;
        th1=0;

        xres_11=x01+[0.40*sin(th1),0.40*sin(th1)+1.2*cos(th1),...
            -0.40*sin(th1)+1.2*cos(th1),-0.40*sin(th1)];
        yres_11=y01+[-0.40*cos(th1),-0.40*cos(th1)+1.2*sin(th1),...
            0.40*cos(th1)+1.2*sin(th1),0.40*cos(th1)];

        xres_12=x01+[-0.05*sin(th1),-0.05*sin(th1)+0.25*cos(th1),...
            -0.40*sin(th1)+0.3*cos(th1),...
            0.25*sin(th1)+0.45*cos(th1),...
            -0.40*sin(th1)+0.6*cos(th1),...
            0.25*sin(th1)+0.75*cos(th1),...
            -0.40*sin(th1)+0.9*cos(th1),...
            -0.05*sin(th1)+0.95*cos(th1),...
            -0.05*sin(th1)+1.2*cos(th1),...
            0.05*sin(th1)+1.2*cos(th1),...
            0.05*sin(th1)+0.95*cos(th1),...
            -0.25*sin(th1)+0.9*cos(th1),...
            0.40*sin(th1)+0.75*cos(th1),...
            -0.25*sin(th1)+0.6*cos(th1),...
            0.40*sin(th1)+0.45*cos(th1),...
            -0.25*sin(th1)+0.3*cos(th1),...
            0.05*sin(th1)+0.25*cos(th1),...
            0.05*sin(th1)];
        yres_12=y01+[0.05*cos(th1),0.05*cos(th1)+0.25*sin(th1),...
            0.40*cos(th1)+0.3*sin(th1),...
            -0.25*cos(th1)+0.45*sin(th1),...
            0.40*cos(th1)+0.6*sin(th1),...
            -0.250*cos(th1)+0.75*sin(th1),...
            0.40*cos(th1)+0.9*sin(th1),...
            0.05*cos(th1)+0.95*sin(th1),...
            0.05*cos(th1)+1.2*sin(th1),...
            -0.05*cos(th1)+1.2*sin(th1),...
            -0.05*cos(th1)+0.95*sin(th1),...
            0.25*cos(th1)+0.9*sin(th1),...
            -0.40*cos(th1)+0.75*sin(th1),...
            0.25*cos(th1)+0.6*sin(th1),...
            -0.40*cos(th1)+0.45*sin(th1),...
            0.25*cos(th1)+0.3*sin(th1),...
            -0.05*cos(th1)+0.25*sin(th1),...
            -0.05*cos(th1)];

        x02=-6;
        y02=1.5;
        th2=0;

        xres_21=x02+[0.40*sin(th2),0.40*sin(th2)+1.2*cos(th2),...
            -0.40*sin(th2)+1.2*cos(th2),-0.40*sin(th2)];
        yres_21=y02+[-0.40*cos(th2),-0.40*cos(th2)+1.2*sin(th2),...
            0.40*cos(th2)+1.2*sin(th2),0.40*cos(th2)];

        xres_22=x02+[-0.05*sin(th2),-0.05*sin(th2)+0.25*cos(th2),...
            -0.40*sin(th2)+0.3*cos(th2),...
            0.25*sin(th2)+0.45*cos(th2),...
            -0.40*sin(th2)+0.6*cos(th2),...

```

```

0.25*sin(th2)+0.75*cos(th2),...
-0.40*sin(th2)+0.9*cos(th2),...
-0.05*sin(th2)+0.95*cos(th2),...
-0.05*sin(th2)+1.2*cos(th2),...
0.05*sin(th2)+1.2*cos(th2),...
0.05*sin(th2)+0.95*cos(th2),...
-0.25*sin(th2)+0.9*cos(th2),...
0.40*sin(th2)+0.75*cos(th2),...
-0.25*sin(th2)+0.6*cos(th2),...
0.40*sin(th2)+0.45*cos(th2),...
-0.25*sin(th2)+0.3*cos(th2),...
0.05*sin(th2)+0.25*cos(th2),...
0.05*sin(th2)];
yres_22=y02+[0.05*cos(th2),0.05*cos(th2)+0.25*sin(th2),...
0.40*cos(th2)+0.3*sin(th2),...
-0.25*cos(th2)+0.45*sin(th2),...
0.40*cos(th2)+0.6*sin(th2),...
-0.250*cos(th2)+0.75*sin(th2),...
0.40*cos(th2)+0.9*sin(th2),...
0.05*cos(th2)+0.95*sin(th2),...
0.05*cos(th2)+1.2*sin(th2),...
-0.05*cos(th2)+1.2*sin(th2),...
-0.05*cos(th2)+0.95*sin(th2),...
0.25*cos(th2)+0.9*sin(th2),...
-0.40*cos(th2)+0.75*sin(th2),...
0.25*cos(th2)+0.6*sin(th2),...
-0.40*cos(th2)+0.45*sin(th2),...
0.25*cos(th2)+0.3*sin(th2),...
-0.05*cos(th2)+0.25*sin(th2),...
-0.05*cos(th2)];

x03=-1;
y03=1.5;
th3=0;

xres_31=x03+[0.40*sin(th3),0.40*sin(th3)+1.2*cos(th3),...
-0.40*sin(th3)+1.2*cos(th3),-0.40*sin(th3)];
yres_31=y03+[-0.40*cos(th3),-0.40*cos(th3)+1.2*sin(th3),...
0.40*cos(th3)+1.2*sin(th3),0.40*cos(th3)];

xres_32=x03+[-0.05*sin(th3),-0.05*sin(th3)+0.25*cos(th3),...
-0.40*sin(th3)+0.3*cos(th3),...
0.25*sin(th3)+0.45*cos(th3),...
-0.40*sin(th3)+0.6*cos(th3),...
0.25*sin(th3)+0.75*cos(th3),...
-0.40*sin(th3)+0.9*cos(th3),...
-0.05*sin(th3)+0.95*cos(th3),...
-0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+0.95*cos(th3),...
-0.25*sin(th3)+0.9*cos(th3),...
0.40*sin(th3)+0.75*cos(th3),...
-0.25*sin(th3)+0.6*cos(th3),...
0.40*sin(th3)+0.45*cos(th3),...
-0.25*sin(th3)+0.3*cos(th3),...
0.05*sin(th3)+0.25*cos(th3),...
0.05*sin(th3)];
yres_32=y03+[0.05*cos(th3),0.05*cos(th3)+0.25*sin(th3),...
0.40*cos(th3)+0.3*sin(th3),...
-0.25*cos(th3)+0.45*sin(th3),...
0.40*cos(th3)+0.6*sin(th3),...
-0.250*cos(th3)+0.75*sin(th3),...
0.40*cos(th3)+0.9*sin(th3),...
0.05*cos(th3)+0.95*sin(th3),...
0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+0.95*sin(th3),...
0.25*cos(th3)+0.9*sin(th3),...
-0.40*cos(th3)+0.75*sin(th3),...
0.25*cos(th3)+0.6*sin(th3),...
-0.40*cos(th3)+0.45*sin(th3),...
0.25*cos(th3)+0.3*sin(th3),...
-0.05*cos(th3)+0.25*sin(th3),...
-0.05*cos(th3)];

x04=-3.0;
y04=-3.0;
th4=pi/2;

xres_41=x04+[0.25*sin(th4),0.25*sin(th4)+1.6*cos(th4),...

```

```

-0.25*sin(th4)+1.6*cos(th4),-0.25*sin(th4)];
yres_41=y04+[-0.25*cos(th4),-0.25*cos(th4)+1.6*sin(th4),...
0.25*cos(th4)+1.6*sin(th4),0.25*cos(th4)];

xres_42=x04+[-0.03*sin(th4),-0.03*sin(th4)+0.33*cos(th4),...
-0.25*sin(th4)+0.4*cos(th4),...
0.10*sin(th4)+0.6*cos(th4),...
-0.25*sin(th4)+0.8*cos(th4),...
0.10*sin(th4)+1.0*cos(th4),...
-0.25*sin(th4)+1.2*cos(th4),...
-0.03*sin(th4)+1.27*cos(th4),...
-0.03*sin(th4)+1.6*cos(th4),...
0.03*sin(th4)+1.6*cos(th4),...
0.03*sin(th4)+1.27*cos(th4),...
-0.10*sin(th4)+1.2*cos(th4),...
0.25*sin(th4)+1.0*cos(th4),...
-0.10*sin(th4)+0.8*cos(th4),...
0.25*sin(th4)+0.6*cos(th4),...
-0.10*sin(th4)+0.4*cos(th4),...
0.03*sin(th4)+0.33*cos(th4),...
0.03*sin(th4)];
yres_42=y04+[0.03*cos(th4),0.03*cos(th4)+0.33*sin(th4),...
0.25*cos(th4)+0.4*sin(th4),...
-0.10*cos(th4)+0.6*sin(th4),...
0.25*cos(th4)+0.8*sin(th4),...
-0.10*cos(th4)+1.0*sin(th4),...
0.25*cos(th4)+1.2*sin(th4),...
0.03*cos(th4)+1.27*sin(th4),...
0.03*cos(th4)+1.6*sin(th4),...
-0.03*cos(th4)+1.6*sin(th4),...
-0.03*cos(th4)+1.27*sin(th4),...
0.10*cos(th4)+1.2*sin(th4),...
-0.25*cos(th4)+1.0*sin(th4),...
0.10*cos(th4)+0.8*sin(th4),...
-0.25*cos(th4)+0.6*sin(th4),...
0.10*cos(th4)+0.4*sin(th4),...
-0.03*cos(th4)+0.33*sin(th4),...
-0.03*cos(th4)];

x05=-0.5;
y05=5.5;

xV1_1=x05+[-0.032,0.032,0.032,-0.032]+0.1-0.3;
yV1_1=y05+[-1.5,-1.5,1.5,1.5];

xV1_2=x05+[-0.05,0.05,0.05,-0.05]-0.2+0.3;
yV1_2=y05+[-0.75,-0.75,0.75,0.75];

x06=4.5;
y06=-2.5;

xV2_1=x06+[-1.0,1.0,1.0,-1.0];
yV2_1=y06+[-0.05,-0.05,0.05,0.05]+0.3;

xV2_2=x06+[-0.4,0.4,0.4,-0.4];
yV2_2=y06+[-0.1,-0.1,0.1,0.1]-0.1;

x07=-8.5;
y07=-2.5;
phi7=0:0.01:2*pi;

xI1_1=x07+0.6*cos(phi7);
yI1_1=y07+0.9*sin(phi7);

xI1_2=x07+0.55*cos(phi7);
yI1_2=y07+0.85*sin(phi7);

xI1_3=x07+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI1_3=y07+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

xcable1=[-8.5,-8.5,x01,x01];
ycable1=y01+[0.1,-0.1,-0.1,0.1];

xcable2=[-8.5,-8.5,x02,x02];
ycable2=y02+[0.1,-0.1,-0.1,0.1];

xcable3=[-8.55,-8.45,-8.45,-8.55];
ycable3=[y01+0.1,y01+0.1,y07+0.9,y07+0.9];

```

```

xcable4=[-8.55,-8.45,-8.45,-8.55];
ycable4=[-6.0,-6.0,y07-0.9,y07-0.9];

xcable5=[-8.5,-8.5,x06,x06];
ycable5=-6.0+[0.1,-0.1,-0.1,0.1];

xcable6=x06+[-0.05,0.05,0.05,-0.05];
ycable6=[-6.0,-6.0,y06-0.2,y06-0.2];

xcable7=x06+[-0.05,0.05,0.05,-0.05];
ycable7=[y01+0.1,y01+0.1,y06+0.35,y06+0.35];

xcable8=[x05+0.15,x05+0.15,x06,x06];
ycable8=y01+[0.1,-0.1,-0.1,0.1];

xcable9=[x05-0.232,x05-0.232,x01+1.2,x01+1.2];
ycable9=y01+[0.1,-0.1,-0.1,0.1];

xcable10=[x06,x06,x03+1.2,x03+1.2];
ycable10=y02+[0.1,-0.1,-0.1,0.1];

xcable11=[x03,x03,x02+1.2,x02+1.2];
ycable11=y02+[0.1,-0.1,-0.1,0.1];

xcable12=x04+[-0.05,0.05,0.05,-0.05];
ycable12=[-6.0,-6.0,y04,y04];

xcable13=x04+[-0.05,0.05,0.05,-0.05];
ycable13=[y02+0.1,y02+0.1,y04+1.6,y04+1.6];

xcurr1=-3.5+[-3.95,-3.45,-3.45,-3.25,-3.45,-3.45,-3.95];
ycurr1=y02+[0.1,0.1,0.3,0.0,-0.3,-0.1,-0.1];

xcurra=5.5+[-3.95,-3.45,-3.45,-3.25,-3.45,-3.45,-3.95];
ycurra=y02+[0.1,0.1,0.3,0.0,-0.3,-0.1,-0.1];

xcurr3=0.5+[-3.95,-3.45,-3.45,-3.25,-3.45,-3.45,-3.95];
ycurr3=y01+[0.1,0.1,0.3,0.0,-0.3,-0.1,-0.1];

```

```

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_11,yres_11,[1.0,1.0,1.0],...
xres_12,yres_12,[0.0,0.0,0.0],...
xres_21,yres_21,[1.0,1.0,1.0],...
xres_22,yres_22,[0.0,0.0,0.0],...
xres_31,yres_31,[1.0,1.0,1.0],...
xres_32,yres_32,[0.0,0.0,0.0],...
xres_41,yres_41,[1.0,1.0,1.0],...
xres_42,yres_42,[0.0,0.0,0.0],...
xV1_1,yV1_1,[0.0,0.0,0.0],...
xV1_2,yV1_2,[0.0,0.0,0.0],...
xV2_1,yV2_1,[0.0,0.0,0.0],...
xV2_2,yV2_2,[0.0,0.0,0.0],...
xI1_1,yI1_1,[0.0,0.0,0.0],...
xI1_2,yI1_2,[1.0,1.0,1.0],...
xI1_3,yI1_3,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
xcable10,ycable10,[0.8,0.6,0.2],...
xcable11,ycable11,[0.8,0.6,0.2],...
xcable12,ycable12,[0.8,0.6,0.2],...
xcable13,ycable13,[0.8,0.6,0.2],...
xcurr1,ycurr1,[0.0,0.0,0.0],...
xcurra,ycurra,[0.0,0.0,0.0],...
xcurr3,ycurr3,[0.0,0.0,0.0],...
'Linestyle','None')

```

text(-11,11,'Να προσδιοριστεί το ισοδύναμοκατά Thevenin του παρακάτω κυκλώματος από τα άκρα a,b.')

```

text(x01+0.5,y01+1.0,'R_1','Color',[0.9,0.2,0.0])
text(x02+0.5,y02+1.0,'R_2','Color',[0.9,0.2,0.0])

```

```

text(x03+0.5,y03+1.0,'R_3','Color',[0.9,0.2,0.0])
text(x04+0.5,y04+0.8,'R_4','Color',[0.9,0.2,0.0])
text(x05+0.5,y05+1.0,'V_1','Color',[0.0,0.2,0.9])
text(x06+0.7,y06+0.9,'V_2','Color',[0.0,0.2,0.9])
text(x07+0.7,y07,'-2I_a','Color',[0.0,0.4,0.4])
text(-7.3,y02-0.7,'J_{1}','Color',[0.0,0.0,0.0])
text(1.7,y02-0.7,'I_{a}','Color',[0.0,0.0,0.0])
text(-3.4,y01-0.7,'J_{3}','Color',[0.0,0.0,0.0])
text(x04-0.2,y02+0.5,'a')
text(x04-0.2,-6.5,'b')

axis([-12,12,-12,12])
axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

% Choose default command line output for g_asknsn_8
handles.output = hObject;

% Update handles structure
guidata(hObject, handles);

% UIWAIT makes g_asknsn_8 wait for user response (see UIRESUME)
% uiwait(handles.figure1);

% --- Outputs from this function are returned to the command line.
function varargout = g_asknsn_8_OutputFcn(hObject, eventdata, handles)
% varargout cell array for returning output args (see VARARGOUT);
% hObject handle to figure
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

% Get default command line output from handles structure
varargout{1} = handles.output;

function edit1_Callback(hObject, eventdata, handles)
% hObject handle to edit1 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit1 as text
% str2double(get(hObject,'String')) returns contents of edit1 as a double

% --- Executes during object creation, after setting all properties.
function edit1_CreateFcn(hObject, eventdata, handles)
% hObject handle to edit1 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles empty - handles not created until after all CreateFcns called

% Hint: edit controls usually have a white background on Windows.
% See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUiControlBackgroundColor'))
set(hObject,'BackgroundColor','white');
end

function edit2_Callback(hObject, eventdata, handles)
% hObject handle to edit2 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit2 as text
% str2double(get(hObject,'String')) returns contents of edit2 as a double

% --- Executes during object creation, after setting all properties.
function edit2_CreateFcn(hObject, eventdata, handles)
% hObject handle to edit2 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles empty - handles not created until after all CreateFcns called

% Hint: edit controls usually have a white background on Windows.

```

```

                                % See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit3_Callback(hObject, eventdata, handles)
    % hObject      handle to edit3 (see GCBO)
    % eventdata    reserved - to be defined in a future version of MATLAB
    % handles      structure with handles and user data (see GUIDATA)

    % Hints: get(hObject,'String') returns contents of edit3 as text
    % str2double(get(hObject,'String')) returns contents of edit3 as a double

    % --- Executes during object creation, after setting all properties.
    function edit3_CreateFcn(hObject, eventdata, handles)
        % hObject      handle to edit3 (see GCBO)
        % eventdata    reserved - to be defined in a future version of MATLAB
        % handles      empty - handles not created until after all CreateFcns called

        % Hint: edit controls usually have a white background on Windows.
        % See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit4_Callback(hObject, eventdata, handles)
    % hObject      handle to edit4 (see GCBO)
    % eventdata    reserved - to be defined in a future version of MATLAB
    % handles      structure with handles and user data (see GUIDATA)

    % Hints: get(hObject,'String') returns contents of edit4 as text
    % str2double(get(hObject,'String')) returns contents of edit4 as a double

    % --- Executes during object creation, after setting all properties.
    function edit4_CreateFcn(hObject, eventdata, handles)
        % hObject      handle to edit4 (see GCBO)
        % eventdata    reserved - to be defined in a future version of MATLAB
        % handles      empty - handles not created until after all CreateFcns called

        % Hint: edit controls usually have a white background on Windows.
        % See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit5_Callback(hObject, eventdata, handles)
    % hObject      handle to edit5 (see GCBO)
    % eventdata    reserved - to be defined in a future version of MATLAB
    % handles      structure with handles and user data (see GUIDATA)

    % Hints: get(hObject,'String') returns contents of edit5 as text
    % str2double(get(hObject,'String')) returns contents of edit5 as a double

    % --- Executes during object creation, after setting all properties.
    function edit5_CreateFcn(hObject, eventdata, handles)
        % hObject      handle to edit5 (see GCBO)
        % eventdata    reserved - to be defined in a future version of MATLAB
        % handles      empty - handles not created until after all CreateFcns called

        % Hint: edit controls usually have a white background on Windows.
        % See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit6_Callback(hObject, eventdata, handles)
    % hObject      handle to edit6 (see GCBO)
    % eventdata    reserved - to be defined in a future version of MATLAB
    % handles      structure with handles and user data (see GUIDATA)

```

```

% Hints: get(hObject,'String') returns contents of edit6 as text
% str2double(get(hObject,'String')) returns contents of edit6 as a double

% --- Executes during object creation, after setting all properties.
function edit6_CreateFcn(hObject, eventdata, handles)
    % hObject    handle to edit6 (see GCBO)
    % eventdata reserved - to be defined in a future version of MATLAB
    % handles    empty - handles not created until after all CreateFcns called

    % Hint: edit controls usually have a white background on Windows.
    %         See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

% --- Executes on button press in pushbutton1.
function pushbutton1_Callback(hObject, eventdata, handles)
    % hObject    handle to pushbutton1 (see GCBO)
    % eventdata reserved - to be defined in a future version of MATLAB
    % handles    structure with handles and user data (see GUIDATA)

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
    global R1;
    global R2;
    global R3;
    global R4;
    global V1;
    global V2;

    R1=str2double(get(handles.edit1,'String'));
    R2=str2double(get(handles.edit2,'String'));
    R3=str2double(get(handles.edit3,'String'));
    R4=str2double(get(handles.edit4,'String'));
    V1=str2double(get(handles.edit5,'String'));
    V2=str2double(get(handles.edit6,'String'));

    if (R1>10|R1<1)
h=warndlg('Βάλτε στην αντίσταση R1 τιμή μεταξύ 1 και 10');
        return
    end

    if (R2>10|R2<1)
h=warndlg('Βάλτε στην αντίσταση R2 τιμή μεταξύ 1 και 10');
        return
    end

    if (R3>10|R3<1)
h=warndlg('Βάλτε στην αντίσταση R3 τιμή μεταξύ 1 και 10');
        return
    end

    if (R4>10|R4<1)
h=warndlg('Βάλτε στην αντίσταση R4 τιμή μεταξύ 1 και 10');
        return
    end

    if (V1>15|V1<5)
h=warndlg('Βάλτε στην τάση V1 τιμή μεταξύ 5 και 15');
        return
    end

    if (V2>15|V2<5)
h=warndlg('Βάλτε στην τάση V2 τιμή μεταξύ 5 και 15');
        return
    end

    axes(handles.axes1)
    axis off;
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
    global snmeio;

    snmeio=1;
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
    x_back=[-12,12,12,-12];
    y_back=[-12,-12,12,12];

    x_tableau=[-11,11,11,-11];
    y_tableau=[-11,-11,9,9];

```



```

x01=-6;
y01=5.5;
th1=0;

xres_11=x01+[0.40*sin(th1),0.40*sin(th1)+1.2*cos(th1),...
-0.40*sin(th1)+1.2*cos(th1),-0.40*sin(th1)];
yres_11=y01+[-0.40*cos(th1),-0.40*cos(th1)+1.2*sin(th1),...
0.40*cos(th1)+1.2*sin(th1),0.40*cos(th1)];

xres_12=x01+[-0.05*sin(th1),-0.05*sin(th1)+0.25*cos(th1),...
-0.40*sin(th1)+0.3*cos(th1),...
0.25*sin(th1)+0.45*cos(th1),...
-0.40*sin(th1)+0.6*cos(th1),...
0.25*sin(th1)+0.75*cos(th1),...
-0.40*sin(th1)+0.9*cos(th1),...
-0.05*sin(th1)+0.95*cos(th1),...
-0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+0.95*cos(th1),...
-0.25*sin(th1)+0.9*cos(th1),...
0.40*sin(th1)+0.75*cos(th1),...
-0.25*sin(th1)+0.6*cos(th1),...
0.40*sin(th1)+0.45*cos(th1),...
-0.25*sin(th1)+0.3*cos(th1),...
0.05*sin(th1)+0.25*cos(th1),...
0.05*sin(th1)];
yres_12=y01+[0.05*cos(th1),0.05*cos(th1)+0.25*sin(th1),...
0.40*cos(th1)+0.3*sin(th1),...
-0.25*cos(th1)+0.45*sin(th1),...
0.40*cos(th1)+0.6*sin(th1),...
-0.250*cos(th1)+0.75*sin(th1),...
0.40*cos(th1)+0.9*sin(th1),...
0.05*cos(th1)+0.95*sin(th1),...
0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+0.95*sin(th1),...
0.25*cos(th1)+0.9*sin(th1),...
-0.40*cos(th1)+0.75*sin(th1),...
0.25*cos(th1)+0.6*sin(th1),...
-0.40*cos(th1)+0.45*sin(th1),...
0.25*cos(th1)+0.3*sin(th1),...
-0.05*cos(th1)+0.25*sin(th1),...
-0.05*cos(th1)];

x02=-6;
y02=1.5;
th2=0;

xres_21=x02+[0.40*sin(th2),0.40*sin(th2)+1.2*cos(th2),...
-0.40*sin(th2)+1.2*cos(th2),-0.40*sin(th2)];
yres_21=y02+[-0.40*cos(th2),-0.40*cos(th2)+1.2*sin(th2),...
0.40*cos(th2)+1.2*sin(th2),0.40*cos(th2)];

xres_22=x02+[-0.05*sin(th2),-0.05*sin(th2)+0.25*cos(th2),...
-0.40*sin(th2)+0.3*cos(th2),...
0.25*sin(th2)+0.45*cos(th2),...
-0.40*sin(th2)+0.6*cos(th2),...
0.25*sin(th2)+0.75*cos(th2),...
-0.40*sin(th2)+0.9*cos(th2),...
-0.05*sin(th2)+0.95*cos(th2),...
-0.05*sin(th2)+1.2*cos(th2),...
0.05*sin(th2)+1.2*cos(th2),...
0.05*sin(th2)+0.95*cos(th2),...
-0.25*sin(th2)+0.9*cos(th2),...
0.40*sin(th2)+0.75*cos(th2),...
-0.25*sin(th2)+0.6*cos(th2),...
0.40*sin(th2)+0.45*cos(th2),...
-0.25*sin(th2)+0.3*cos(th2),...
0.05*sin(th2)+0.25*cos(th2),...
0.05*sin(th2)];
yres_22=y02+[0.05*cos(th2),0.05*cos(th2)+0.25*sin(th2),...
0.40*cos(th2)+0.3*sin(th2),...
-0.25*cos(th2)+0.45*sin(th2),...
0.40*cos(th2)+0.6*sin(th2),...
-0.250*cos(th2)+0.75*sin(th2),...
0.40*cos(th2)+0.9*sin(th2),...
0.05*cos(th2)+0.95*sin(th2),...
0.05*cos(th2)+1.2*sin(th2),...
-0.05*cos(th2)+1.2*sin(th2),...
-0.05*cos(th2)+0.95*sin(th2),...
0.25*cos(th2)+0.9*sin(th2),...

```

```

-0.40*cos(th2)+0.75*sin(th2),...
0.25*cos(th2)+0.6*sin(th2),...
-0.40*cos(th2)+0.45*sin(th2),...
0.25*cos(th2)+0.3*sin(th2),...
-0.05*cos(th2)+0.25*sin(th2),...
-0.05*cos(th2)];

x03=-1;
y03=1.5;
th3=0;

xres_31=x03+[0.40*sin(th3),0.40*sin(th3)+1.2*cos(th3),...
-0.40*sin(th3)+1.2*cos(th3),-0.40*sin(th3)];
yres_31=y03+[-0.40*cos(th3),-0.40*cos(th3)+1.2*sin(th3),...
0.40*cos(th3)+1.2*sin(th3),0.40*cos(th3)];

xres_32=x03+[-0.05*sin(th3),-0.05*sin(th3)+0.25*cos(th3),...
-0.40*sin(th3)+0.3*cos(th3),...
0.25*sin(th3)+0.45*cos(th3),...
-0.40*sin(th3)+0.6*cos(th3),...
0.25*sin(th3)+0.75*cos(th3),...
-0.40*sin(th3)+0.9*cos(th3),...
-0.05*sin(th3)+0.95*cos(th3),...
-0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+0.95*cos(th3),...
-0.25*sin(th3)+0.9*cos(th3),...
0.40*sin(th3)+0.75*cos(th3),...
-0.25*sin(th3)+0.6*cos(th3),...
0.40*sin(th3)+0.45*cos(th3),...
-0.25*sin(th3)+0.3*cos(th3),...
0.05*sin(th3)+0.25*cos(th3),...
0.05*sin(th3)];
yres_32=y03+[0.05*cos(th3),0.05*cos(th3)+0.25*sin(th3),...
0.40*cos(th3)+0.3*sin(th3),...
-0.25*cos(th3)+0.45*sin(th3),...
0.40*cos(th3)+0.6*sin(th3),...
-0.250*cos(th3)+0.75*sin(th3),...
0.40*cos(th3)+0.9*sin(th3),...
0.05*cos(th3)+0.95*sin(th3),...
0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+0.95*sin(th3),...
0.25*cos(th3)+0.9*sin(th3),...
-0.40*cos(th3)+0.75*sin(th3),...
0.25*cos(th3)+0.6*sin(th3),...
-0.40*cos(th3)+0.45*sin(th3),...
0.25*cos(th3)+0.3*sin(th3),...
-0.05*cos(th3)+0.25*sin(th3),...
-0.05*cos(th3)];

x04=-3.0;
y04=-3.0;
th4=pi/2;

xres_41=x04+[0.25*sin(th4),0.25*sin(th4)+1.6*cos(th4),...
-0.25*sin(th4)+1.6*cos(th4),-0.25*sin(th4)];
yres_41=y04+[-0.25*cos(th4),-0.25*cos(th4)+1.6*sin(th4),...
0.25*cos(th4)+1.6*sin(th4),0.25*cos(th4)];

xres_42=x04+[-0.03*sin(th4),-0.03*sin(th4)+0.33*cos(th4),...
-0.25*sin(th4)+0.4*cos(th4),...
0.10*sin(th4)+0.6*cos(th4),...
-0.25*sin(th4)+0.8*cos(th4),...
0.10*sin(th4)+1.0*cos(th4),...
-0.25*sin(th4)+1.2*cos(th4),...
-0.03*sin(th4)+1.27*cos(th4),...
-0.03*sin(th4)+1.6*cos(th4),...
0.03*sin(th4)+1.6*cos(th4),...
0.03*sin(th4)+1.27*cos(th4),...
-0.10*sin(th4)+1.2*cos(th4),...
0.25*sin(th4)+1.0*cos(th4),...
-0.10*sin(th4)+0.8*cos(th4),...
0.25*sin(th4)+0.6*cos(th4),...
-0.10*sin(th4)+0.4*cos(th4),...
0.03*sin(th4)+0.33*cos(th4),...
0.03*sin(th4)];
yres_42=y04+[0.03*cos(th4),0.03*cos(th4)+0.33*sin(th4),...
0.25*cos(th4)+0.4*sin(th4),...
-0.10*cos(th4)+0.6*sin(th4),...

```

```

0.25*cos(th4)+0.8*sin(th4),...
-0.10*cos(th4)+1.0*sin(th4),...
0.25*cos(th4)+1.2*sin(th4),...
0.03*cos(th4)+1.27*sin(th4),...
0.03*cos(th4)+1.6*sin(th4),...
-0.03*cos(th4)+1.6*sin(th4),...
-0.03*cos(th4)+1.27*sin(th4),...
0.10*cos(th4)+1.2*sin(th4),...
-0.25*cos(th4)+1.0*sin(th4),...
0.10*cos(th4)+0.8*sin(th4),...
-0.25*cos(th4)+0.6*sin(th4),...
0.10*cos(th4)+0.4*sin(th4),...
-0.03*cos(th4)+0.33*sin(th4),...
-0.03*cos(th4)];

x05=-0.5;
y05=5.5;

xV1_1=x05+[-0.032,0.032,0.032,-0.032]+0.1-0.3;
yV1_1=y05+[-1.5,-1.5,1.5,1.5];

xV1_2=x05+[-0.05,0.05,0.05,-0.05]-0.2+0.3;
yV1_2=y05+[-0.75,-0.75,0.75,0.75];

x06=4.5;
y06=-2.5;

xV2_1=x06+[-1.0,1.0,1.0,-1.0];
yV2_1=y06+[-0.05,-0.05,0.05,0.05]+0.3;

xV2_2=x06+[-0.4,0.4,0.4,-0.4];
yV2_2=y06+[-0.1,-0.1,0.1,0.1]-0.1;

x07=-8.5;
y07=-2.5;
phi7=0:0.01:2*pi;

xI1_1=x07+0.6*cos(phi7);
yI1_1=y07+0.9*sin(phi7);

xI1_2=x07+0.55*cos(phi7);
yI1_2=y07+0.85*sin(phi7);

xI1_3=x07+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI1_3=y07+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

xcable1=[-8.5,-8.5,x01,x01];
ycable1=y01+[0.1,-0.1,-0.1,0.1];

xcable2=[-8.5,-8.5,x02,x02];
ycable2=y02+[0.1,-0.1,-0.1,0.1];

xcable3=[-8.55,-8.45,-8.45,-8.55];
ycable3=[y01+0.1,y01+0.1,y07+0.9,y07+0.9];

xcable4=[-8.55,-8.45,-8.45,-8.55];
ycable4=[-6.0,-6.0,y07-0.9,y07-0.9];

xcable5=[-8.5,-8.5,x06,x06];
ycable5=-6.0+[0.1,-0.1,-0.1,0.1];

xcable6=x06+[-0.05,0.05,0.05,-0.05];
ycable6=[-6.0,-6.0,y06-0.2,y06-0.2];

xcable7=x06+[-0.05,0.05,0.05,-0.05];
ycable7=[y01+0.1,y01+0.1,y06+0.35,y06+0.35];

xcable8=[x05+0.15,x05+0.15,x06,x06];
ycable8=y01+[0.1,-0.1,-0.1,0.1];

xcable9=[x05-0.232,x05-0.232,x01+1.2,x01+1.2];
ycable9=y01+[0.1,-0.1,-0.1,0.1];

xcable10=[x06,x06,x03+1.2,x03+1.2];
ycable10=y02+[0.1,-0.1,-0.1,0.1];

xcable11=[x03,x03,x02+1.2,x02+1.2];
ycable11=y02+[0.1,-0.1,-0.1,0.1];

```

```

xcable12=x04+[-0.05,0.05,0.05,-0.05];
ycable12=[-6.0,-6.0,y04,y04];

xcable13=x04+[-0.05,0.05,0.05,-0.05];
ycable13=[y02+0.1,y02+0.1,y04+1.6,y04+1.6];

xcurr1=-3.5+[-3.95,-3.45,-3.45,-3.25,-3.45,-3.45,-3.95];
ycurr1=y02+[0.1,0.1,0.3,0.0,-0.3,-0.1,-0.1];

xcurra=5.5+[-3.95,-3.45,-3.45,-3.25,-3.45,-3.45,-3.95];
ycurra=y02+[0.1,0.1,0.3,0.0,-0.3,-0.1,-0.1];

xcurr3=0.5+[-3.95,-3.45,-3.45,-3.25,-3.45,-3.45,-3.95];
ycurr3=y01+[0.1,0.1,0.3,0.0,-0.3,-0.1,-0.1];

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_11,yres_11,[1.0,1.0,1.0],...
xres_12,yres_12,[0.0,0.0,0.0],...
xres_21,yres_21,[1.0,1.0,1.0],...
xres_22,yres_22,[0.0,0.0,0.0],...
xres_31,yres_31,[1.0,1.0,1.0],...
xres_32,yres_32,[0.0,0.0,0.0],...
xres_41,yres_41,[1.0,1.0,1.0],...
xres_42,yres_42,[0.0,0.0,0.0],...
xV1_1,yV1_1,[0.0,0.0,0.0],...
xV1_2,yV1_2,[0.0,0.0,0.0],...
xV2_1,yV2_1,[0.0,0.0,0.0],...
xV2_2,yV2_2,[0.0,0.0,0.0],...
xI1_1,yI1_1,[0.0,0.0,0.0],...
xI1_2,yI1_2,[1.0,1.0,1.0],...
xI1_3,yI1_3,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
xcable10,ycable10,[0.8,0.6,0.2],...
xcable11,ycable11,[0.8,0.6,0.2],...
xcable12,ycable12,[0.8,0.6,0.2],...
xcable13,ycable13,[0.8,0.6,0.2],...
xcurr1,ycurr1,[0.0,0.0,0.0],...
xcurra,ycurra,[0.0,0.0,0.0],...
xcurr3,ycurr3,[0.0,0.0,0.0],...
'LineStyle','None')

text(-11,11,'Βραχυκυκλώνουμε τις πηγές τάσης V_{1}, V_{2} και βάζουμε στα άκρα a,b πηγή γνωστής τάσης V_{ab},
που διαρρέεται από ρεύμα')
text(-11,10,'I_{ab}. Τότε έχουμε το παρακάτω κύκλωμα:')

text(x01+0.5,y01+1.0,'R_1','Color',[0.9,0.2,0.0])
text(x02+0.5,y02+1.0,'R_2','Color',[0.9,0.2,0.0])
text(x03+0.5,y03+1.0,'R_3','Color',[0.9,0.2,0.0])
text(x04+0.5,y04+0.8,'R_4','Color',[0.9,0.2,0.0])
text(x05+0.5,y05+1.0,'V_1','Color',[0.0,0.2,0.9])
text(x06+0.7,y06+0.9,'V_2','Color',[0.0,0.2,0.9])
text(x07+0.7,y07,'-2I_a','Color',[0.0,0.4,0.4])
text(-7.3,y02-0.7,'J_{1}','Color',[0.0,0.0,0.0])
text(1.7,y02-0.7,'I_{a}','Color',[0.0,0.0,0.0])
text(-3.4,y01-0.7,'J_{3}','Color',[0.0,0.0,0.0])
text(x04-0.2,y02+0.5,'a')
text(x04-0.2,-6.5,'b')

axis([-12,12,-12,12])
axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

% --- Executes on button press in pushbutton2.
function pushbutton2_Callback(hObject, eventdata, handles)
% hObject handle to pushbutton2 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB

```

```

% handles      structure with handles and user data (see GUIDATA)
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
global R1;
global R2;
global R3;
global R4;
global V1;
global V2;

global snmeio;

snmeio=snmeio+1;

if (snmeio==4)
    snmeio=1;
end
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
Ra=R1+R2;
Rp=1+R2*(R3+R4)/(R3*R4)+3*R1/R3+R1/R4;
RT=Ra/Rp;
nRT=num2str(0.01*round(100*RT));
Va=R4*V1/(R1+R2)-V2;
Rp1=R3+R4+(2*R1+R3)*R4/(R1+R2);
Ia=Va/Rp1;
nIa=num2str(0.01*round(100*Ia));
VT=R3*Ia+V2;
nVT=num2str(0.01*round(100*VT));
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
if (snmeio==1)
    axes(handles.axes1);
    cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
    x_back=[-12,12,12,-12];
    y_back=[-12,-12,12,12];

    x_tableau=[-11,11,11,-11];
    y_tableau=[-11,-11,9,9];

    x01=-6;
    y01=5.5;
    th1=0;

    xres_11=x01+[0.40*sin(th1),0.40*sin(th1)+1.2*cos(th1),...
-0.40*sin(th1)+1.2*cos(th1),-0.40*sin(th1)];
    yres_11=y01+[-0.40*cos(th1),-0.40*cos(th1)+1.2*sin(th1),...
0.40*cos(th1)+1.2*sin(th1),0.40*cos(th1)];

    xres_12=x01+[-0.05*sin(th1),-0.05*sin(th1)+0.25*cos(th1),...
-0.40*sin(th1)+0.3*cos(th1),...
0.25*sin(th1)+0.45*cos(th1),...
-0.40*sin(th1)+0.6*cos(th1),...
0.25*sin(th1)+0.75*cos(th1),...
-0.40*sin(th1)+0.9*cos(th1),...
-0.05*sin(th1)+0.95*cos(th1),...
-0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+0.95*cos(th1),...
-0.25*sin(th1)+0.9*cos(th1),...
0.40*sin(th1)+0.75*cos(th1),...
-0.25*sin(th1)+0.6*cos(th1),...
0.40*sin(th1)+0.45*cos(th1),...
-0.25*sin(th1)+0.3*cos(th1),...
0.05*sin(th1)+0.25*cos(th1),...
0.05*sin(th1)];
    yres_12=y01+[0.05*cos(th1),0.05*cos(th1)+0.25*sin(th1),...
0.40*cos(th1)+0.3*sin(th1),...
-0.25*cos(th1)+0.45*sin(th1),...
0.40*cos(th1)+0.6*sin(th1),...
-0.250*cos(th1)+0.75*sin(th1),...
0.40*cos(th1)+0.9*sin(th1),...
0.05*cos(th1)+0.95*sin(th1),...
0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+0.95*sin(th1),...
0.25*cos(th1)+0.9*sin(th1),...
-0.40*cos(th1)+0.75*sin(th1),...
0.25*cos(th1)+0.6*sin(th1),...
-0.40*cos(th1)+0.45*sin(th1),...
0.25*cos(th1)+0.3*sin(th1),...
-0.05*cos(th1)+0.25*sin(th1),...
-0.05*cos(th1)];

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-0.05*cos(th1)];

x02=-6;
y02=1.5;
th2=0;

xres_21=x02+[0.40*sin(th2),0.40*sin(th2)+1.2*cos(th2),...
-0.40*sin(th2)+1.2*cos(th2),-0.40*sin(th2)];
yres_21=y02+[-0.40*cos(th2),-0.40*cos(th2)+1.2*sin(th2),...
0.40*cos(th2)+1.2*sin(th2),0.40*cos(th2)];

xres_22=x02+[-0.05*sin(th2),-0.05*sin(th2)+0.25*cos(th2),...
-0.40*sin(th2)+0.3*cos(th2),...
0.25*sin(th2)+0.45*cos(th2),...
-0.40*sin(th2)+0.6*cos(th2),...
0.25*sin(th2)+0.75*cos(th2),...
-0.40*sin(th2)+0.9*cos(th2),...
-0.05*sin(th2)+0.95*cos(th2),...
-0.05*sin(th2)+1.2*cos(th2),...
0.05*sin(th2)+1.2*cos(th2),...
0.05*sin(th2)+0.95*cos(th2),...
-0.25*sin(th2)+0.9*cos(th2),...
0.40*sin(th2)+0.75*cos(th2),...
-0.25*sin(th2)+0.6*cos(th2),...
0.40*sin(th2)+0.45*cos(th2),...
-0.25*sin(th2)+0.3*cos(th2),...
0.05*sin(th2)+0.25*cos(th2),...
0.05*sin(th2)];
yres_22=y02+[0.05*cos(th2),0.05*cos(th2)+0.25*sin(th2),...
0.40*cos(th2)+0.3*sin(th2),...
-0.25*cos(th2)+0.45*sin(th2),...
0.40*cos(th2)+0.6*sin(th2),...
-0.250*cos(th2)+0.75*sin(th2),...
0.40*cos(th2)+0.9*sin(th2),...
0.05*cos(th2)+0.95*sin(th2),...
0.05*cos(th2)+1.2*sin(th2),...
-0.05*cos(th2)+1.2*sin(th2),...
-0.05*cos(th2)+0.95*sin(th2),...
0.25*cos(th2)+0.9*sin(th2),...
-0.40*cos(th2)+0.75*sin(th2),...
0.25*cos(th2)+0.6*sin(th2),...
-0.40*cos(th2)+0.45*sin(th2),...
0.25*cos(th2)+0.3*sin(th2),...
-0.05*cos(th2)+0.25*sin(th2),...
-0.05*cos(th2)];

x03=-1;
y03=1.5;
th3=0;

xres_31=x03+[0.40*sin(th3),0.40*sin(th3)+1.2*cos(th3),...
-0.40*sin(th3)+1.2*cos(th3),-0.40*sin(th3)];
yres_31=y03+[-0.40*cos(th3),-0.40*cos(th3)+1.2*sin(th3),...
0.40*cos(th3)+1.2*sin(th3),0.40*cos(th3)];

xres_32=x03+[-0.05*sin(th3),-0.05*sin(th3)+0.25*cos(th3),...
-0.40*sin(th3)+0.3*cos(th3),...
0.25*sin(th3)+0.45*cos(th3),...
-0.40*sin(th3)+0.6*cos(th3),...
0.25*sin(th3)+0.75*cos(th3),...
-0.40*sin(th3)+0.9*cos(th3),...
-0.05*sin(th3)+0.95*cos(th3),...
-0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+0.95*cos(th3),...
-0.25*sin(th3)+0.9*cos(th3),...
0.40*sin(th3)+0.75*cos(th3),...
-0.25*sin(th3)+0.6*cos(th3),...
0.40*sin(th3)+0.45*cos(th3),...
-0.25*sin(th3)+0.3*cos(th3),...
0.05*sin(th3)+0.25*cos(th3),...
0.05*sin(th3)];
yres_32=y03+[0.05*cos(th3),0.05*cos(th3)+0.25*sin(th3),...
0.40*cos(th3)+0.3*sin(th3),...
-0.25*cos(th3)+0.45*sin(th3),...
0.40*cos(th3)+0.6*sin(th3),...
-0.250*cos(th3)+0.75*sin(th3),...
0.40*cos(th3)+0.9*sin(th3),...
0.05*cos(th3)+0.95*sin(th3),...
0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+1.2*sin(th3),...

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-0.05*cos(th3)+0.95*sin(th3),...
0.25*cos(th3)+0.9*sin(th3),...
-0.40*cos(th3)+0.75*sin(th3),...
0.25*cos(th3)+0.6*sin(th3),...
-0.40*cos(th3)+0.45*sin(th3),...
0.25*cos(th3)+0.3*sin(th3),...
-0.05*cos(th3)+0.25*sin(th3),...
-0.05*cos(th3)];

x04=-3.0;
y04=-3.0;
th4=pi/2;

xres_41=x04+[0.25*sin(th4),0.25*sin(th4)+1.6*cos(th4),...
-0.25*sin(th4)+1.6*cos(th4),-0.25*sin(th4)];
yres_41=y04+[-0.25*cos(th4),-0.25*cos(th4)+1.6*sin(th4),...
0.25*cos(th4)+1.6*sin(th4),0.25*cos(th4)];

xres_42=x04+[-0.03*sin(th4),-0.03*sin(th4)+0.33*cos(th4),...
-0.25*sin(th4)+0.4*cos(th4),...
0.10*sin(th4)+0.6*cos(th4),...
-0.25*sin(th4)+0.8*cos(th4),...
0.10*sin(th4)+1.0*cos(th4),...
-0.25*sin(th4)+1.2*cos(th4),...
-0.03*sin(th4)+1.27*cos(th4),...
-0.03*sin(th4)+1.6*cos(th4),...
0.03*sin(th4)+1.6*cos(th4),...
0.03*sin(th4)+1.27*cos(th4),...
-0.10*sin(th4)+1.2*cos(th4),...
0.25*sin(th4)+1.0*cos(th4),...
-0.10*sin(th4)+0.8*cos(th4),...
0.25*sin(th4)+0.6*cos(th4),...
-0.10*sin(th4)+0.4*cos(th4),...
0.03*sin(th4)+0.33*cos(th4),...
0.03*sin(th4)];
yres_42=y04+[0.03*cos(th4),0.03*cos(th4)+0.33*sin(th4),...
0.25*cos(th4)+0.4*sin(th4),...
-0.10*cos(th4)+0.6*sin(th4),...
0.25*cos(th4)+0.8*sin(th4),...
-0.10*cos(th4)+1.0*sin(th4),...
0.25*cos(th4)+1.2*sin(th4),...
0.03*cos(th4)+1.27*sin(th4),...
0.03*cos(th4)+1.6*sin(th4),...
-0.03*cos(th4)+1.6*sin(th4),...
-0.03*cos(th4)+1.27*sin(th4),...
0.10*cos(th4)+1.2*sin(th4),...
-0.25*cos(th4)+1.0*sin(th4),...
0.10*cos(th4)+0.8*sin(th4),...
-0.25*cos(th4)+0.6*sin(th4),...
0.10*cos(th4)+0.4*sin(th4),...
-0.03*cos(th4)+0.33*sin(th4),...
-0.03*cos(th4)];

x05=-0.5;
y05=5.5;

xv1_1=x05+[-0.032,0.032,0.032,-0.032]+0.1-0.3;
yv1_1=y05+[-1.5,-1.5,1.5,1.5];

xv1_2=x05+[-0.05,0.05,0.05,-0.05]-0.2+0.3;
yv1_2=y05+[-0.75,-0.75,0.75,0.75];

x06=4.5;
y06=-2.5;

xv2_1=x06+[-1.0,1.0,1.0,-1.0];
yv2_1=y06+[-0.05,-0.05,0.05,0.05]+0.3;

xv2_2=x06+[-0.4,0.4,0.4,-0.4];
yv2_2=y06+[-0.1,-0.1,0.1,0.1]-0.1;

x07=-8.5;
y07=-2.5;
phi7=0:0.01:2*pi;

xi1_1=x07+0.6*cos(phi7);
yi1_1=y07+0.9*sin(phi7);

```

```

        xI1_2=x07+0.55*cos(phi7);
        yI1_2=y07+0.85*sin(phi7);
xI1_3=x07+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI1_3=y07+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

        xcable1=[-8.5,-8.5,x01,x01];
        ycable1=y01+[0.1,-0.1,-0.1,0.1];

        xcable2=[-8.5,-8.5,x02,x02];
        ycable2=y02+[0.1,-0.1,-0.1,0.1];

        xcable3=[-8.55,-8.45,-8.45,-8.55];
        ycable3=[y01+0.1,y01+0.1,y07+0.9,y07+0.9];

        xcable4=[-8.55,-8.45,-8.45,-8.55];
        ycable4=[-6.0,-6.0,y07-0.9,y07-0.9];

        xcable5=[-8.5,-8.5,x06,x06];
        ycable5=-6.0+[0.1,-0.1,-0.1,0.1];

        xcable6=x06+[-0.05,0.05,0.05,-0.05];
        ycable6=[-6.0,-6.0,y06-0.2,y06-0.2];

        xcable7=x06+[-0.05,0.05,0.05,-0.05];
        ycable7=[y01+0.1,y01+0.1,y06+0.35,y06+0.35];

        xcable8=[x05+0.15,x05+0.15,x06,x06];
        ycable8=y01+[0.1,-0.1,-0.1,0.1];

xcable9=[x05-0.232,x05-0.232,x01+1.2,x01+1.2];
        ycable9=y01+[0.1,-0.1,-0.1,0.1];

        xcable10=[x06,x06,x03+1.2,x03+1.2];
        ycable10=y02+[0.1,-0.1,-0.1,0.1];

        xcable11=[x03,x03,x02+1.2,x02+1.2];
        ycable11=y02+[0.1,-0.1,-0.1,0.1];

        xcable12=x04+[-0.05,0.05,0.05,-0.05];
        ycable12=[-6.0,-6.0,y04,y04];

        xcable13=x04+[-0.05,0.05,0.05,-0.05];
        ycable13=[y02+0.1,y02+0.1,y04+1.6,y04+1.6];

xcurr1=-3.5+[-3.95,-3.45,-3.45,-3.25,-3.45,-3.45,-3.95];
        ycurr1=y02+[0.1,0.1,0.3,0.0,-0.3,-0.1,-0.1];

xcurra=5.5+[-3.95,-3.45,-3.45,-3.25,-3.45,-3.45,-3.95];
        ycurra=y02+[0.1,0.1,0.3,0.0,-0.3,-0.1,-0.1];

xcurr3=0.5+[-3.95,-3.45,-3.45,-3.25,-3.45,-3.45,-3.95];
        ycurr3=y01+[0.1,0.1,0.3,0.0,-0.3,-0.1,-0.1];

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_11,yres_11,[1.0,1.0,1.0],...
xres_12,yres_12,[0.0,0.0,0.0],...
xres_21,yres_21,[1.0,1.0,1.0],...
xres_22,yres_22,[0.0,0.0,0.0],...
xres_31,yres_31,[1.0,1.0,1.0],...
xres_32,yres_32,[0.0,0.0,0.0],...
xres_41,yres_41,[1.0,1.0,1.0],...
xres_42,yres_42,[0.0,0.0,0.0],...
xV1_1,yV1_1,[0.0,0.0,0.0],...
xV1_2,yV1_2,[0.0,0.0,0.0],...
xV2_1,yV2_1,[0.0,0.0,0.0],...
xV2_2,yV2_2,[0.0,0.0,0.0],...
xI1_1,yI1_1,[0.0,0.0,0.0],...
xI1_2,yI1_2,[1.0,1.0,1.0],...
xI1_3,yI1_3,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...

```



```

        xcable8,ycable8,[0.8,0.6,0.2],...
        xcable9,ycable9,[0.8,0.6,0.2],...
        xcable10,ycable10,[0.8,0.6,0.2],...
        xcable11,ycable11,[0.8,0.6,0.2],...
        xcable12,ycable12,[0.8,0.6,0.2],...
        xcable13,ycable13,[0.8,0.6,0.2],...
        xcurr1,ycurr1,[0.0,0.0,0.0],...
        xcurra,ycurra,[0.0,0.0,0.0],...
        xcurr3,ycurr3,[0.0,0.0,0.0],...
        'LineStyle','None')

text(-11,11,'Βραχυκυκλώνουμε τις πηγές τάσης V_{1}, V_{2} και βάζουμε στα άκρα a,b πηγή γνωστής τάσης V_{ab},
        που διαρρέεται από ρεύμα')
text(-11,10,'I_{ab}. Τότε έχουμε το παρακάτω κύκλωμα:')

text(x01+0.5,y01+1.0,'R_1','Color',[0.9,0.2,0.0])
text(x02+0.5,y02+1.0,'R_2','Color',[0.9,0.2,0.0])
text(x03+0.5,y03+1.0,'R_3','Color',[0.9,0.2,0.0])
text(x04+0.5,y04+0.8,'R_4','Color',[0.9,0.2,0.0])
text(x05+0.5,y05+1.0,'V_1','Color',[0.0,0.2,0.9])
text(x06+0.7,y06+0.9,'V_2','Color',[0.0,0.2,0.9])
text(x07+0.7,y07,'-2I_a','Color',[0.0,0.4,0.4])
text(-7.3,y02-0.7,'J_{1}','Color',[0.0,0.0,0.0])
text(1.7,y02-0.7,'I_{a}','Color',[0.0,0.0,0.0])
text(-3.4,y01-0.7,'J_{3}','Color',[0.0,0.0,0.0])
text(x04-0.2,y02+0.5,'a')
text(x04-0.2,-6.5,'b')

axis([-12,12,-12,12])
axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
elseif (snmeio==2)
axes(handles.axes1);
cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,8,8];

x01=-9.0;
y01=0.0;
th1=pi/2;

xres_11=x01+[0.25*sin(th1),0.25*sin(th1)+1.6*cos(th1),...
-0.25*sin(th1)+1.6*cos(th1),-0.25*sin(th1)];
yres_11=y01+[-0.25*cos(th1),-0.25*cos(th1)+1.6*sin(th1),...
0.25*cos(th1)+1.6*sin(th1),0.25*cos(th1)];

xres_12=x01+[-0.03*sin(th1),-0.03*sin(th1)+0.33*cos(th1),...
-0.25*sin(th1)+0.4*cos(th1),...
0.10*sin(th1)+0.6*cos(th1),...
-0.25*sin(th1)+0.8*cos(th1),...
0.10*sin(th1)+1.0*cos(th1),...
-0.25*sin(th1)+1.2*cos(th1),...
-0.03*sin(th1)+1.27*cos(th1),...
-0.03*sin(th1)+1.6*cos(th1),...
0.03*sin(th1)+1.6*cos(th1),...
0.03*sin(th1)+1.27*cos(th1),...
-0.10*sin(th1)+1.2*cos(th1),...
0.25*sin(th1)+1.0*cos(th1),...
-0.10*sin(th1)+0.8*cos(th1),...
0.25*sin(th1)+0.6*cos(th1),...
-0.10*sin(th1)+0.4*cos(th1),...
0.03*sin(th1)+0.33*cos(th1),...
0.03*sin(th1)];
yres_12=y01+[0.03*cos(th1),0.03*cos(th1)+0.33*sin(th1),...
0.25*cos(th1)+0.4*sin(th1),...
-0.10*cos(th1)+0.6*sin(th1),...
0.25*cos(th1)+0.8*sin(th1),...
-0.10*cos(th1)+1.0*sin(th1),...
0.25*cos(th1)+1.2*sin(th1),...
0.03*cos(th1)+1.27*sin(th1),...
0.03*cos(th1)+1.6*sin(th1),...
-0.03*cos(th1)+1.6*sin(th1),...
-0.03*cos(th1)+1.27*sin(th1),...
0.10*cos(th1)+1.2*sin(th1),...
-0.25*cos(th1)+1.0*sin(th1),...

```

```

0.10*cos(th1)+0.8*sin(th1),...
-0.25*cos(th1)+0.6*sin(th1),...
0.10*cos(th1)+0.4*sin(th1),...
-0.03*cos(th1)+0.33*sin(th1),...
-0.03*cos(th1)];

x02=-4;
y02=4.5;
th2=0;

xres_21=x02+[0.40*sin(th2),0.40*sin(th2)+1.2*cos(th2),...
-0.40*sin(th2)+1.2*cos(th2),-0.40*sin(th2)];
yres_21=y02+[-0.40*cos(th2),-0.40*cos(th2)+1.2*sin(th2),...
0.40*cos(th2)+1.2*sin(th2),0.40*cos(th2)];

xres_22=x02+[-0.05*sin(th2),-0.05*sin(th2)+0.25*cos(th2),...
-0.40*sin(th2)+0.3*cos(th2),...
0.25*sin(th2)+0.45*cos(th2),...
-0.40*sin(th2)+0.6*cos(th2),...
0.25*sin(th2)+0.75*cos(th2),...
-0.40*sin(th2)+0.9*cos(th2),...
-0.05*sin(th2)+0.95*cos(th2),...
-0.05*sin(th2)+1.2*cos(th2),...
0.05*sin(th2)+1.2*cos(th2),...
0.05*sin(th2)+0.95*cos(th2),...
-0.25*sin(th2)+0.9*cos(th2),...
0.40*sin(th2)+0.75*cos(th2),...
-0.25*sin(th2)+0.6*cos(th2),...
0.40*sin(th2)+0.45*cos(th2),...
-0.25*sin(th2)+0.3*cos(th2),...
0.05*sin(th2)+0.25*cos(th2),...
0.05*sin(th2)];
yres_22=y02+[0.05*cos(th2),0.05*cos(th2)+0.25*sin(th2),...
0.40*cos(th2)+0.3*sin(th2),...
-0.25*cos(th2)+0.45*sin(th2),...
0.40*cos(th2)+0.6*sin(th2),...
-0.25*cos(th2)+0.75*sin(th2),...
0.40*cos(th2)+0.9*sin(th2),...
0.05*cos(th2)+0.95*sin(th2),...
0.05*cos(th2)+1.2*sin(th2),...
-0.05*cos(th2)+1.2*sin(th2),...
-0.05*cos(th2)+0.95*sin(th2),...
0.25*cos(th2)+0.9*sin(th2),...
-0.40*cos(th2)+0.75*sin(th2),...
0.25*cos(th2)+0.6*sin(th2),...
-0.40*cos(th2)+0.45*sin(th2),...
0.25*cos(th2)+0.3*sin(th2),...
-0.05*cos(th2)+0.25*sin(th2),...
-0.05*cos(th2)];

x03=0.0;
y03=0.0;
th3=pi/2;

xres_31=x03+[0.25*sin(th3),0.25*sin(th3)+1.6*cos(th3),...
-0.25*sin(th3)+1.6*cos(th3),-0.25*sin(th3)];
yres_31=y03+[-0.25*cos(th3),-0.25*cos(th3)+1.6*sin(th3),...
0.25*cos(th3)+1.6*sin(th3),0.25*cos(th3)];

xres_32=x03+[-0.03*sin(th3),-0.03*sin(th3)+0.33*cos(th3),...
-0.25*sin(th3)+0.4*cos(th3),...
0.10*sin(th3)+0.6*cos(th3),...
-0.25*sin(th3)+0.8*cos(th3),...
0.10*sin(th3)+1.0*cos(th3),...
-0.25*sin(th3)+1.2*cos(th3),...
-0.03*sin(th3)+1.27*cos(th3),...
-0.03*sin(th3)+1.6*cos(th3),...
0.03*sin(th3)+1.6*cos(th3),...
0.03*sin(th3)+1.27*cos(th3),...
-0.10*sin(th3)+1.2*cos(th3),...
0.25*sin(th3)+1.0*cos(th3),...
-0.10*sin(th3)+0.8*cos(th3),...
0.25*sin(th3)+0.6*cos(th3),...
-0.10*sin(th3)+0.4*cos(th3),...
0.03*sin(th3)+0.33*cos(th3),...
0.03*sin(th3)];
yres_32=y03+[0.03*cos(th3),0.03*cos(th3)+0.33*sin(th3),...
0.25*cos(th3)+0.4*sin(th3),...
-0.10*cos(th3)+0.6*sin(th3),...
0.25*cos(th3)+0.8*sin(th3),...

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-0.10*cos(th3)+1.0*sin(th3),...
0.25*cos(th3)+1.2*sin(th3),...
0.03*cos(th3)+1.27*sin(th3),...
0.03*cos(th3)+1.6*sin(th3),...
-0.03*cos(th3)+1.6*sin(th3),...
-0.03*cos(th3)+1.27*sin(th3),...
0.10*cos(th3)+1.2*sin(th3),...
-0.25*cos(th3)+1.0*sin(th3),...
0.10*cos(th3)+0.8*sin(th3),...
-0.25*cos(th3)+0.6*sin(th3),...
0.10*cos(th3)+0.4*sin(th3),...
-0.03*cos(th3)+0.33*sin(th3),...
-0.03*cos(th3)];

x04=4.0;
y04=0.0;
th4=pi/2;

xres_41=x04+[0.25*sin(th4),0.25*sin(th4)+1.6*cos(th4),...
-0.25*sin(th4)+1.6*cos(th4),-0.25*sin(th4)];
yres_41=y04+[-0.25*cos(th4),-0.25*cos(th4)+1.6*sin(th4),...
0.25*cos(th4)+1.6*sin(th4),0.25*cos(th4)];

xres_42=x04+[-0.03*sin(th4),-0.03*sin(th4)+0.33*cos(th4),...
-0.25*sin(th4)+0.4*cos(th4),...
0.10*sin(th4)+0.6*cos(th4),...
-0.25*sin(th4)+0.8*cos(th4),...
0.10*sin(th4)+1.0*cos(th4),...
-0.25*sin(th4)+1.2*cos(th4),...
-0.03*sin(th4)+1.27*cos(th4),...
-0.03*sin(th4)+1.6*cos(th4),...
0.03*sin(th4)+1.6*cos(th4),...
0.03*sin(th4)+1.27*cos(th4),...
-0.10*sin(th4)+1.2*cos(th4),...
0.25*sin(th4)+1.0*cos(th4),...
-0.10*sin(th4)+0.8*cos(th4),...
0.25*sin(th4)+0.6*cos(th4),...
-0.10*sin(th4)+0.4*cos(th4),...
0.03*sin(th4)+0.33*cos(th4),...
0.03*sin(th4)];
yres_42=y04+[0.03*cos(th4),0.03*cos(th4)+0.33*sin(th4),...
0.25*cos(th4)+0.4*sin(th4),...
-0.10*cos(th4)+0.6*sin(th4),...
0.25*cos(th4)+0.8*sin(th4),...
-0.10*cos(th4)+1.0*sin(th4),...
0.25*cos(th4)+1.2*sin(th4),...
0.03*cos(th4)+1.27*sin(th4),...
0.03*cos(th4)+1.6*sin(th4),...
-0.03*cos(th4)+1.6*sin(th4),...
-0.03*cos(th4)+1.27*sin(th4),...
0.10*cos(th4)+1.2*sin(th4),...
-0.25*cos(th4)+1.0*sin(th4),...
0.10*cos(th4)+0.8*sin(th4),...
-0.25*cos(th4)+0.6*sin(th4),...
0.10*cos(th4)+0.4*sin(th4),...
-0.03*cos(th4)+0.33*sin(th4),...
-0.03*cos(th4)];

x05=-5.5;
y05=0.5;
phi5=0:0.01:2*pi;

xI1_1=x05+0.6*cos(phi5);
yI1_1=y05+0.9*sin(phi5);

xI1_2=x05+0.55*cos(phi5);
yI1_2=y05+0.85*sin(phi5);

xI1_3=x05+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI1_3=y05+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

x06=8.5;
y06=0.5;

xV1_1=x06+[-1.0,1.0,1.0,-1.0];
yV1_1=y06+[-0.05,-0.05,0.05,0.05]+0.3;

xV1_2=x06+[-0.4,0.4,0.4,-0.4];
yV1_2=y06+[-0.1,-0.1,0.1,0.1]-0.1;

```

```

        xcable1=[x02,x02,x01,x01];
        ycable1=y02+[0.1,-0.1,-0.1,0.1];

        xcable2=x01+[-0.05,0.05,0.05,-0.05];
        ycable2=[y01+1.6,y01+1.6,y02+0.1,y02+0.1];

        xcable3=x01+[-0.05,0.05,0.05,-0.05];
        ycable3=[y01,y01,-4.0,-4.0];

        xcable4=[x06,x06,x01,x01];
        ycable4=-4.0+[0.1,-0.1,-0.1,0.1];

        xcable5=x06+[-0.05,0.05,0.05,-0.05];
        ycable5=[y06+0.35,y06+0.35,y02+0.1,y02+0.1];

        xcable6=x06+[-0.05,0.05,0.05,-0.05];
        ycable6=[y06-0.2,y06-0.2,-4.0,-4.0];

        xcable7=[x02+1.2,x02+1.2,x06,x06];
        ycable7=y02+[0.1,-0.1,-0.1,0.1];

        xcable8=x05+[-0.05,0.05,0.05,-0.05];
        ycable8=[y05+0.9,y05+0.9,y02+0.1,y02+0.1];

        xcable9=x05+[-0.05,0.05,0.05,-0.05];
        ycable9=[y05-0.9,y05-0.9,-4.0,-4.0];

        xcable10=x03+[-0.05,0.05,0.05,-0.05];
        ycable10=[y03+1.6,y03+1.6,y02+0.1,y02+0.1];

        xcable11=x03+[-0.05,0.05,0.05,-0.05];
        ycable11=[y03,y03,-4.0,-4.0];

        xcable12=x04+[-0.05,0.05,0.05,-0.05];
        ycable12=[y04+1.6,y04+1.6,y02+0.1,y02+0.1];

        xcable13=x04+[-0.05,0.05,0.05,-0.05];
        ycable13=[y04,y04,-4.0,-4.0];

        xcurrab=x06+[-0.05,0.05,0.05,0.25,0.0,-0.25,-0.05];
        ycurrab=y06+1.5+[0.0,0.0,1.0,1.0,1.5,1.0,1.0];

        xcurr1=x04+[-0.05,0.05,0.05,0.25,0.0,-0.25,-0.05];
        ycurr1=y04+4.0+[0.0,0.0,-1.0,-1.0,-1.5,-1.0,-1.0];

        xcurra=x03+[-0.05,0.05,0.05,0.25,0.0,-0.25,-0.05];
        ycurra=y03+4.0+[0.0,0.0,-1.0,-1.0,-1.5,-1.0,-1.0];

        xcurr2=x04-1.0+[0.0,0.0,-0.7,-0.7,-1.2,-0.7,-0.7];
        ycurr2=y02+[-0.1,0.1,0.1,0.4,0.0,-0.4,-0.1];

        xcurr3=x03-1.0+[0.0,0.0,-0.7,-0.7,-1.2,-0.7,-0.7];
        ycurr3=y02+[-0.1,0.1,0.1,0.4,0.0,-0.4,-0.1];

        xcurr4=x05-1.0+[0.0,0.0,-0.7,-0.7,-1.2,-0.7,-0.7];
        ycurr4=y02+[-0.1,0.1,0.1,0.4,0.0,-0.4,-0.1];

```

```

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_11,yres_11,[1.0,1.0,1.0],...
xres_12,yres_12,[0.0,0.0,0.0],...
xres_21,yres_21,[1.0,1.0,1.0],...
xres_22,yres_22,[0.0,0.0,0.0],...
xres_31,yres_31,[1.0,1.0,1.0],...
xres_32,yres_32,[0.0,0.0,0.0],...
xres_41,yres_41,[1.0,1.0,1.0],...
xres_42,yres_42,[0.0,0.0,0.0],...
xi1_1,yi1_1,[0.0,0.0,0.0],...
xi1_2,yi1_2,[1.0,1.0,1.0],...
xi1_3,yi1_3,[0.0,0.0,0.0],...
xv1_1,yv1_1,[0.0,0.0,0.0],...
xv1_2,yv1_2,[0.0,0.0,0.0],...

```

```

xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
xcable10,ycable10,[0.8,0.6,0.2],...
xcable11,ycable11,[0.8,0.6,0.2],...
xcable12,ycable12,[0.8,0.6,0.2],...
xcable13,ycable13,[0.8,0.6,0.2],...
xcurrab,ycurrab,[0.0,0.0,0.0],...
xcurr1,ycurr1,[0.0,0.0,0.0],...
xcurra,ycurra,[0.0,0.0,0.0],...
xcurr2,ycurr2,[0.0,0.0,0.0],...
xcurr3,ycurr3,[0.0,0.0,0.0],...
xcurr4,ycurr4,[0.0,0.0,0.0],...
'Linestyle','None')

text(-11,11,'Ισχύουν οι σχέσεις  $I_{1}=V_{ab}/R_{4}$ ,  $I_{2}=I_{ab}-I_{1}=I_{a}+I_{3}$ ,  $I_{4}=I_{3}-2I_{a}$ ,
 $V_{ab}=I_{a}R_{3}$ ,  $V_{ab}=I_{3}R_{2}+I_{4}R_{1}$ ')
text(4,11,'Από αυτές τις σχέσεις προκύπτει ότι ')
text(-11,10,' $I_{3}=I_{ab}-V_{ab}/(R_{3}+R_{4})/(R_{3}R_{4})$  και  $I_{4}=I_{ab}-V_{ab}/((3/R_{3})+(1/R_{4}))$ . Από
αυτές θα έχουμε για την αντίσταση Thevenin του αρχικού κυκλώματος')
text(-11,9,' $R_{T}=(V_{ab}/I_{ab})=(R_{a}/R_{p})$ =')
text(-6.8,9.2,nRT)
text(-5.9,9.2,'Ohm.')

text(x01+0.5,y01+0.8,'R_1','Color',[0.9,0.2,0.0])
text(x02+0.6,y02+1.0,'R_2','Color',[0.9,0.2,0.0])
text(x03+0.5,y03+0.8,'R_3','Color',[0.9,0.2,0.0])
text(x04+0.5,y04+0.8,'R_4','Color',[0.9,0.2,0.0])
text(x05+0.7,y05,'-2I_a','Color',[0.0,0.4,0.4])
text(x06+0.4,y06+1.9,'I_{ab}','Color',[0.0,0.0,0.0])
text(x04+0.4,y04+3.2,'I_{1}','Color',[0.0,0.0,0.0])
text(x04-1.4,y02+0.8,'I_{2}','Color',[0.0,0.0,0.0])
text(x03+0.4,y03+3.2,'I_{a}','Color',[0.0,0.0,0.0])
text(x03-1.4,y02+0.8,'I_{3}','Color',[0.0,0.0,0.0])
text(x05-1.4,y02+0.8,'I_{4}','Color',[0.0,0.0,0.0])
text(x06+0.4,y06+0.9,'V_{ab}','Color',[0.0,0.2,0.9])
text(x06-2.4,y02+0.8,'a','Color',[0.0,0.0,0.0])
text(x06-2.4,-4.8,'b','Color',[0.0,0.0,0.0])

axis([-12,12,-12,12])
axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
elseif (snmeio==3)
axes(handles.axes1);
cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,7,7];

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
'Linestyle','None')

text(-11,11,'Από το αρχικό κύκλωμα ισχύουν οι εξής σχέσεις:  $V_{ab}=(J_{1}-I_{a})R_{4}$ ,
 $V_{ab}=R_{3}I_{a}+V_{2}$ ,  $J_{1}+J_{3}=-2I_{a}$ ,  $-R_{1}J_{3}-V_{1}+R_{3}I_{a}+J_{1}R_{2}=0$ . ')
text(-11,10,'Από αυτές έχουμε  $(2R_{1}+R_{3})I_{a}+(R_{1}+R_{2})J_{1}=V_{1}$ , οπότε θα έχουμε ')
text(0.3,10,' $V_{ab}=R_{4}(V_{1}/(R_{1}+R_{2})-(2R_{1}+R_{3})I_{a}/(R_{1}+R_{2}))-I_{a}R_{3}$ ')
text(-11,9.0,'Τελικά  $I_{a}(R_{3}+R_{4})+(2R_{1}+R_{3})R_{4}/(R_{1}+R_{2})=R_{4}V_{1}/(R_{1}+R_{2})-V_{2}$ ,
οπότε')
text(1.0,9.0,'I_{a}=')
text(1.8,9.2,nIa)
text(2.8,9.2,'Ohm.')
text(-11,8.0,'Τελικά για την τάση Thevenin θα έχουμε  $V_{T}=V_{ab}=R_{3}I_{a}+V_{2}$ =')
text(0.0,8.2,nVT)
text(0.8,8.2,'Volt.')

axis([-12,12,-12,12])
axis off;
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

```

```

else
end

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

% --- Executes on button press in pushbutton3.
function pushbutton3_Callback(hObject, eventdata, handles)
% hObject    handle to pushbutton3 (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
global R1;
global R2;
global R3;
global R4;
global V1;
global V2;

global snmeio;

snmeio=snmeio-1;

if (snmeio==0)
snmeio=3;
end
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
Ra=R1+R2;
Rp=1+R2*(R3+R4)/(R3*R4)+3*R1/R3+R1/R4;
RT=Ra/Rp;
nRT=num2str(0.01*round(100*RT));
Va=R4*V1/(R1+R2)-V2;
Rp1=R3+R4+(2*R1+R3)*R4/(R1+R2);
Ia=Va/Rp1;
nIa=num2str(0.01*round(100*Ia));
VT=R3*Ia+V2;
nVT=num2str(0.01*round(100*VT));
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
if (snmeio==1)
axes(handles.axes1);
cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,9,9];

x01=-6;
y01=5.5;
th1=0;

xres_11=x01+[0.40*sin(th1),0.40*sin(th1)+1.2*cos(th1),...
-0.40*sin(th1)+1.2*cos(th1),-0.40*sin(th1)];
yres_11=y01+[-0.40*cos(th1),-0.40*cos(th1)+1.2*sin(th1),...
0.40*cos(th1)+1.2*sin(th1),0.40*cos(th1)];

xres_12=x01+[-0.05*sin(th1),-0.05*sin(th1)+0.25*cos(th1),...
-0.40*sin(th1)+0.3*cos(th1),...
0.25*sin(th1)+0.45*cos(th1),...
-0.40*sin(th1)+0.6*cos(th1),...
0.25*sin(th1)+0.75*cos(th1),...
-0.40*sin(th1)+0.9*cos(th1),...
-0.05*sin(th1)+0.95*cos(th1),...
-0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+0.95*cos(th1),...
-0.25*sin(th1)+0.9*cos(th1),...
0.40*sin(th1)+0.75*cos(th1),...
-0.25*sin(th1)+0.6*cos(th1),...
0.40*sin(th1)+0.45*cos(th1),...
-0.25*sin(th1)+0.3*cos(th1),...
0.05*sin(th1)+0.25*cos(th1),...
0.05*sin(th1)];
yres_12=y01+[0.05*cos(th1),0.05*cos(th1)+0.25*sin(th1),...
0.40*cos(th1)+0.3*sin(th1),...
-0.25*cos(th1)+0.45*sin(th1),...
0.40*cos(th1)+0.6*sin(th1),...
-0.250*cos(th1)+0.75*sin(th1),...

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```

0.40*cos(th1)+0.9*sin(th1),...
0.05*cos(th1)+0.95*sin(th1),...
0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+0.95*sin(th1),...
0.25*cos(th1)+0.9*sin(th1),...
-0.40*cos(th1)+0.75*sin(th1),...
0.25*cos(th1)+0.6*sin(th1),...
-0.40*cos(th1)+0.45*sin(th1),...
0.25*cos(th1)+0.3*sin(th1),...
-0.05*cos(th1)+0.25*sin(th1),...
-0.05*cos(th1)];

x02=-6;
y02=1.5;
th2=0;

xres_21=x02+[0.40*sin(th2),0.40*sin(th2)+1.2*cos(th2),...
-0.40*sin(th2)+1.2*cos(th2),-0.40*sin(th2)];
yres_21=y02+[-0.40*cos(th2),-0.40*cos(th2)+1.2*sin(th2),...
0.40*cos(th2)+1.2*sin(th2),0.40*cos(th2)];

xres_22=x02+[-0.05*sin(th2),-0.05*sin(th2)+0.25*cos(th2),...
-0.40*sin(th2)+0.3*cos(th2),...
0.25*sin(th2)+0.45*cos(th2),...
-0.40*sin(th2)+0.6*cos(th2),...
0.25*sin(th2)+0.75*cos(th2),...
-0.40*sin(th2)+0.9*cos(th2),...
-0.05*sin(th2)+0.95*cos(th2),...
-0.05*sin(th2)+1.2*cos(th2),...
0.05*sin(th2)+1.2*cos(th2),...
0.05*sin(th2)+0.95*cos(th2),...
-0.25*sin(th2)+0.9*cos(th2),...
0.40*sin(th2)+0.75*cos(th2),...
-0.25*sin(th2)+0.6*cos(th2),...
0.40*sin(th2)+0.45*cos(th2),...
-0.25*sin(th2)+0.3*cos(th2),...
0.05*sin(th2)+0.25*cos(th2),...
0.05*sin(th2)];
yres_22=y02+[0.05*cos(th2),0.05*cos(th2)+0.25*sin(th2),...
0.40*cos(th2)+0.3*sin(th2),...
-0.25*cos(th2)+0.45*sin(th2),...
0.40*cos(th2)+0.6*sin(th2),...
-0.250*cos(th2)+0.75*sin(th2),...
0.40*cos(th2)+0.9*sin(th2),...
0.05*cos(th2)+0.95*sin(th2),...
0.05*cos(th2)+1.2*sin(th2),...
-0.05*cos(th2)+1.2*sin(th2),...
-0.05*cos(th2)+0.95*sin(th2),...
0.25*cos(th2)+0.9*sin(th2),...
-0.40*cos(th2)+0.75*sin(th2),...
0.25*cos(th2)+0.6*sin(th2),...
-0.40*cos(th2)+0.45*sin(th2),...
0.25*cos(th2)+0.3*sin(th2),...
-0.05*cos(th2)+0.25*sin(th2),...
-0.05*cos(th2)];

x03=-1;
y03=1.5;
th3=0;

xres_31=x03+[0.40*sin(th3),0.40*sin(th3)+1.2*cos(th3),...
-0.40*sin(th3)+1.2*cos(th3),-0.40*sin(th3)];
yres_31=y03+[-0.40*cos(th3),-0.40*cos(th3)+1.2*sin(th3),...
0.40*cos(th3)+1.2*sin(th3),0.40*cos(th3)];

xres_32=x03+[-0.05*sin(th3),-0.05*sin(th3)+0.25*cos(th3),...
-0.40*sin(th3)+0.3*cos(th3),...
0.25*sin(th3)+0.45*cos(th3),...
-0.40*sin(th3)+0.6*cos(th3),...
0.25*sin(th3)+0.75*cos(th3),...
-0.40*sin(th3)+0.9*cos(th3),...
-0.05*sin(th3)+0.95*cos(th3),...
-0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+0.95*cos(th3),...
-0.25*sin(th3)+0.9*cos(th3),...
0.40*sin(th3)+0.75*cos(th3),...
-0.25*sin(th3)+0.6*cos(th3),...
0.40*sin(th3)+0.45*cos(th3),...
-0.25*sin(th3)+0.3*cos(th3),...
-0.25*sin(th3)+0.3*cos(th3),...

```

```

0.05*sin(th3)+0.25*cos(th3),...
0.05*sin(th3)];
yres_32=y03+[0.05*cos(th3),0.05*cos(th3)+0.25*sin(th3),...
0.40*cos(th3)+0.3*sin(th3),...
-0.25*cos(th3)+0.45*sin(th3),...
0.40*cos(th3)+0.6*sin(th3),...
-0.250*cos(th3)+0.75*sin(th3),...
0.40*cos(th3)+0.9*sin(th3),...
0.05*cos(th3)+0.95*sin(th3),...
0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+0.95*sin(th3),...
0.25*cos(th3)+0.9*sin(th3),...
-0.40*cos(th3)+0.75*sin(th3),...
0.25*cos(th3)+0.6*sin(th3),...
-0.40*cos(th3)+0.45*sin(th3),...
0.25*cos(th3)+0.3*sin(th3),...
-0.05*cos(th3)+0.25*sin(th3),...
-0.05*cos(th3)];

x04=-3.0;
y04=-3.0;
th4=pi/2;

xres_41=x04+[0.25*sin(th4),0.25*sin(th4)+1.6*cos(th4),...
-0.25*sin(th4)+1.6*cos(th4),-0.25*sin(th4)];
yres_41=y04+[-0.25*cos(th4),-0.25*cos(th4)+1.6*sin(th4),...
0.25*cos(th4)+1.6*sin(th4),0.25*cos(th4)];

xres_42=x04+[-0.03*sin(th4),-0.03*sin(th4)+0.33*cos(th4),...
-0.25*sin(th4)+0.4*cos(th4),...
0.10*sin(th4)+0.6*cos(th4),...
-0.25*sin(th4)+0.8*cos(th4),...
0.10*sin(th4)+1.0*cos(th4),...
-0.25*sin(th4)+1.2*cos(th4),...
-0.03*sin(th4)+1.27*cos(th4),...
-0.03*sin(th4)+1.6*cos(th4),...
0.03*sin(th4)+1.6*cos(th4),...
0.03*sin(th4)+1.27*cos(th4),...
-0.10*sin(th4)+1.2*cos(th4),...
0.25*sin(th4)+1.0*cos(th4),...
-0.10*sin(th4)+0.8*cos(th4),...
0.25*sin(th4)+0.6*cos(th4),...
-0.10*sin(th4)+0.4*cos(th4),...
0.03*sin(th4)+0.33*cos(th4),...
0.03*sin(th4)];
yres_42=y04+[0.03*cos(th4),0.03*cos(th4)+0.33*sin(th4),...
0.25*cos(th4)+0.4*sin(th4),...
-0.10*cos(th4)+0.6*sin(th4),...
0.25*cos(th4)+0.8*sin(th4),...
-0.10*cos(th4)+1.0*sin(th4),...
0.25*cos(th4)+1.2*sin(th4),...
0.03*cos(th4)+1.27*sin(th4),...
0.03*cos(th4)+1.6*sin(th4),...
-0.03*cos(th4)+1.6*sin(th4),...
-0.03*cos(th4)+1.27*sin(th4),...
0.10*cos(th4)+1.2*sin(th4),...
-0.25*cos(th4)+1.0*sin(th4),...
0.10*cos(th4)+0.8*sin(th4),...
-0.25*cos(th4)+0.6*sin(th4),...
0.10*cos(th4)+0.4*sin(th4),...
-0.03*cos(th4)+0.33*sin(th4),...
-0.03*cos(th4)];

x05=-0.5;
y05=5.5;

xv1_1=x05+[-0.032,0.032,0.032,-0.032]+0.1-0.3;
yv1_1=y05+[-1.5,-1.5,1.5,1.5];

xv1_2=x05+[-0.05,0.05,0.05,-0.05]-0.2+0.3;
yv1_2=y05+[-0.75,-0.75,0.75,0.75];

x06=4.5;
y06=-2.5;

xv2_1=x06+[-1.0,1.0,1.0,-1.0];
yv2_1=y06+[-0.05,-0.05,0.05,0.05]+0.3;

```



```

xV2_2=x06+[-0.4,0.4,0.4,-0.4];
yV2_2=y06+[-0.1,-0.1,0.1,0.1]-0.1;

x07=-8.5;
y07=-2.5;
phi7=0:0.01:2*pi;

xI1_1=x07+0.6*cos(phi7);
yI1_1=y07+0.9*sin(phi7);

xI1_2=x07+0.55*cos(phi7);
yI1_2=y07+0.85*sin(phi7);

xI1_3=x07+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI1_3=y07+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

xcable1=[-8.5,-8.5,x01,x01];
ycable1=y01+[0.1,-0.1,-0.1,0.1];

xcable2=[-8.5,-8.5,x02,x02];
ycable2=y02+[0.1,-0.1,-0.1,0.1];

xcable3=[-8.55,-8.45,-8.45,-8.55];
ycable3=[y01+0.1,y01+0.1,y07+0.9,y07+0.9];

xcable4=[-8.55,-8.45,-8.45,-8.55];
ycable4=[-6.0,-6.0,y07-0.9,y07-0.9];

xcable5=[-8.5,-8.5,x06,x06];
ycable5=-6.0+[0.1,-0.1,-0.1,0.1];

xcable6=x06+[-0.05,0.05,0.05,-0.05];
ycable6=[-6.0,-6.0,y06-0.2,y06-0.2];

xcable7=x06+[-0.05,0.05,0.05,-0.05];
ycable7=[y01+0.1,y01+0.1,y06+0.35,y06+0.35];

xcable8=[x05+0.15,x05+0.15,x06,x06];
ycable8=y01+[0.1,-0.1,-0.1,0.1];

xcable9=[x05-0.232,x05-0.232,x01+1.2,x01+1.2];
ycable9=y01+[0.1,-0.1,-0.1,0.1];

xcable10=[x06,x06,x03+1.2,x03+1.2];
ycable10=y02+[0.1,-0.1,-0.1,0.1];

xcable11=[x03,x03,x02+1.2,x02+1.2];
ycable11=y02+[0.1,-0.1,-0.1,0.1];

xcable12=x04+[-0.05,0.05,0.05,-0.05];
ycable12=[-6.0,-6.0,y04,y04];

xcable13=x04+[-0.05,0.05,0.05,-0.05];
ycable13=[y02+0.1,y02+0.1,y04+1.6,y04+1.6];

xcurr1=-3.5+[-3.95,-3.45,-3.45,-3.25,-3.45,-3.45,-3.95];
ycurr1=y02+[0.1,0.1,0.3,0.0,-0.3,-0.1,-0.1];

xcurra=5.5+[-3.95,-3.45,-3.45,-3.25,-3.45,-3.45,-3.95];
ycurra=y02+[0.1,0.1,0.3,0.0,-0.3,-0.1,-0.1];

xcurr3=0.5+[-3.95,-3.45,-3.45,-3.25,-3.45,-3.45,-3.95];
ycurr3=y01+[0.1,0.1,0.3,0.0,-0.3,-0.1,-0.1];

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_11,yres_11,[1.0,1.0,1.0],...
xres_12,yres_12,[0.0,0.0,0.0],...
xres_21,yres_21,[1.0,1.0,1.0],...
xres_22,yres_22,[0.0,0.0,0.0],...
xres_31,yres_31,[1.0,1.0,1.0],...
xres_32,yres_32,[0.0,0.0,0.0],...
xres_41,yres_41,[1.0,1.0,1.0],...
xres_42,yres_42,[0.0,0.0,0.0],...
xV1_1,yV1_1,[0.0,0.0,0.0],...
xV1_2,yV1_2,[0.0,0.0,0.0],...
xV2_1,yV2_1,[0.0,0.0,0.0],...

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xV2_2,yV2_2,[0.0,0.0,0.0],...
xI1_1,yI1_1,[0.0,0.0,0.0],...
xI1_2,yI1_2,[1.0,1.0,1.0],...
xI1_3,yI1_3,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
xcable10,ycable10,[0.8,0.6,0.2],...
xcable11,ycable11,[0.8,0.6,0.2],...
xcable12,ycable12,[0.8,0.6,0.2],...
xcable13,ycable13,[0.8,0.6,0.2],...
xcurr1,ycurr1,[0.0,0.0,0.0],...
xcurra,ycurra,[0.0,0.0,0.0],...
xcurr3,ycurr3,[0.0,0.0,0.0],...
    'Linestyle','None')
text(-11,11,'Βραχυκυκλώνουμε τις πηγές τάσης V_{1}, V_{2} και βάζουμε στα άκρα a,b πηγή γνωστής τάσης V_{ab},
    που διαρρέεται από ρεύμα')
text(-11,10,'I_{ab}. Τότε έχουμε το παρακάτω κύκλωμα:')

text(x01+0.5,y01+1.0,'R_1','Color',[0.9,0.2,0.0])
text(x02+0.5,y02+1.0,'R_2','Color',[0.9,0.2,0.0])
text(x03+0.5,y03+1.0,'R_3','Color',[0.9,0.2,0.0])
text(x04+0.5,y04+0.8,'R_4','Color',[0.9,0.2,0.0])
text(x05+0.5,y05+1.0,'V_1','Color',[0.0,0.2,0.9])
text(x06+0.7,y06+0.9,'V_2','Color',[0.0,0.2,0.9])
text(x07+0.7,y07,'-2I_a','Color',[0.0,0.4,0.4])
text(-7.3,y02-0.7,'J_{1}','Color',[0.0,0.0,0.0])
text(1.7,y02-0.7,'I_{a}','Color',[0.0,0.0,0.0])
text(-3.4,y01-0.7,'J_{3}','Color',[0.0,0.0,0.0])
text(x04-0.2,y02+0.5,'a')
text(x04-0.2,-6.5,'b')

axis([-12,12,-12,12])
axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
elseif (snmeio==2)
axes(handles.axes1);
cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=-12,12,12,-12];
y_back=-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,8,8];

x01=-9.0;
y01=0.0;
th1=pi/2;

xres_11=x01+[0.25*sin(th1),0.25*sin(th1)+1.6*cos(th1),...
-0.25*sin(th1)+1.6*cos(th1),-0.25*sin(th1)];
yres_11=y01+[-0.25*cos(th1),-0.25*cos(th1)+1.6*sin(th1),...
0.25*cos(th1)+1.6*sin(th1),0.25*cos(th1)];

xres_12=x01+[-0.03*sin(th1),-0.03*sin(th1)+0.33*cos(th1),...
-0.25*sin(th1)+0.4*cos(th1),...
0.10*sin(th1)+0.6*cos(th1),...
-0.25*sin(th1)+0.8*cos(th1),...
0.10*sin(th1)+1.0*cos(th1),...
-0.25*sin(th1)+1.2*cos(th1),...
-0.03*sin(th1)+1.27*cos(th1),...
-0.03*sin(th1)+1.6*cos(th1),...
0.03*sin(th1)+1.6*cos(th1),...
0.03*sin(th1)+1.27*cos(th1),...
-0.10*sin(th1)+1.2*cos(th1),...
0.25*sin(th1)+1.0*cos(th1),...
-0.10*sin(th1)+0.8*cos(th1),...
0.25*sin(th1)+0.6*cos(th1),...
-0.10*sin(th1)+0.4*cos(th1),...
0.03*sin(th1)+0.33*cos(th1),...
0.03*sin(th1)];
yres_12=y01+[0.03*cos(th1),0.03*cos(th1)+0.33*sin(th1),...

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0.25*cos(th1)+0.4*sin(th1),...
-0.10*cos(th1)+0.6*sin(th1),...
0.25*cos(th1)+0.8*sin(th1),...
-0.10*cos(th1)+1.0*sin(th1),...
0.25*cos(th1)+1.2*sin(th1),...
0.03*cos(th1)+1.27*sin(th1),...
0.03*cos(th1)+1.6*sin(th1),...
-0.03*cos(th1)+1.6*sin(th1),...
-0.03*cos(th1)+1.27*sin(th1),...
0.10*cos(th1)+1.2*sin(th1),...
-0.25*cos(th1)+1.0*sin(th1),...
0.10*cos(th1)+0.8*sin(th1),...
-0.25*cos(th1)+0.6*sin(th1),...
0.10*cos(th1)+0.4*sin(th1),...
-0.03*cos(th1)+0.33*sin(th1),...
-0.03*cos(th1)];

x02=-4;
y02=4.5;
th2=0;

xres_21=x02+[0.40*sin(th2),0.40*sin(th2)+1.2*cos(th2),...
-0.40*sin(th2)+1.2*cos(th2),-0.40*sin(th2)];
yres_21=y02+[-0.40*cos(th2),-0.40*cos(th2)+1.2*sin(th2),...
0.40*cos(th2)+1.2*sin(th2),0.40*cos(th2)];

xres_22=x02+[-0.05*sin(th2),-0.05*sin(th2)+0.25*cos(th2),...
-0.40*sin(th2)+0.3*cos(th2),...
0.25*sin(th2)+0.45*cos(th2),...
-0.40*sin(th2)+0.6*cos(th2),...
0.25*sin(th2)+0.75*cos(th2),...
-0.40*sin(th2)+0.9*cos(th2),...
-0.05*sin(th2)+0.95*cos(th2),...
-0.05*sin(th2)+1.2*cos(th2),...
0.05*sin(th2)+1.2*cos(th2),...
0.05*sin(th2)+0.95*cos(th2),...
-0.25*sin(th2)+0.9*cos(th2),...
0.40*sin(th2)+0.75*cos(th2),...
-0.25*sin(th2)+0.6*cos(th2),...
0.40*sin(th2)+0.45*cos(th2),...
-0.25*sin(th2)+0.3*cos(th2),...
0.05*sin(th2)+0.25*cos(th2),...
0.05*sin(th2)];
yres_22=y02+[0.05*cos(th2),0.05*cos(th2)+0.25*sin(th2),...
0.40*cos(th2)+0.3*sin(th2),...
-0.25*cos(th2)+0.45*sin(th2),...
0.40*cos(th2)+0.6*sin(th2),...
-0.250*cos(th2)+0.75*sin(th2),...
0.40*cos(th2)+0.9*sin(th2),...
0.05*cos(th2)+0.95*sin(th2),...
0.05*cos(th2)+1.2*sin(th2),...
-0.05*cos(th2)+1.2*sin(th2),...
-0.05*cos(th2)+0.95*sin(th2),...
0.25*cos(th2)+0.9*sin(th2),...
-0.40*cos(th2)+0.75*sin(th2),...
0.25*cos(th2)+0.6*sin(th2),...
-0.40*cos(th2)+0.45*sin(th2),...
0.25*cos(th2)+0.3*sin(th2),...
-0.05*cos(th2)+0.25*sin(th2),...
-0.05*cos(th2)];

x03=0.0;
y03=0.0;
th3=pi/2;

xres_31=x03+[0.25*sin(th3),0.25*sin(th3)+1.6*cos(th3),...
-0.25*sin(th3)+1.6*cos(th3),-0.25*sin(th3)];
yres_31=y03+[-0.25*cos(th3),-0.25*cos(th3)+1.6*sin(th3),...
0.25*cos(th3)+1.6*sin(th3),0.25*cos(th3)];

xres_32=x03+[-0.03*sin(th3),-0.03*sin(th3)+0.33*cos(th3),...
-0.25*sin(th3)+0.4*cos(th3),...
0.10*sin(th3)+0.6*cos(th3),...
-0.25*sin(th3)+0.8*cos(th3),...
0.10*sin(th3)+1.0*cos(th3),...
-0.25*sin(th3)+1.2*cos(th3),...
-0.03*sin(th3)+1.27*cos(th3),...
-0.03*sin(th3)+1.6*cos(th3),...
0.03*sin(th3)+1.6*cos(th3),...
0.03*sin(th3)+1.27*cos(th3),...

```

```

-0.10*sin(th3)+1.2*cos(th3),...
0.25*sin(th3)+1.0*cos(th3),...
-0.10*sin(th3)+0.8*cos(th3),...
0.25*sin(th3)+0.6*cos(th3),...
-0.10*sin(th3)+0.4*cos(th3),...
0.03*sin(th3)+0.33*cos(th3),...
0.03*sin(th3)];
yres_32=y03+[0.03*cos(th3),0.03*cos(th3)+0.33*sin(th3),...
0.25*cos(th3)+0.4*sin(th3),...
-0.10*cos(th3)+0.6*sin(th3),...
0.25*cos(th3)+0.8*sin(th3),...
-0.10*cos(th3)+1.0*sin(th3),...
0.25*cos(th3)+1.2*sin(th3),...
0.03*cos(th3)+1.27*sin(th3),...
0.03*cos(th3)+1.6*sin(th3),...
-0.03*cos(th3)+1.6*sin(th3),...
-0.03*cos(th3)+1.27*sin(th3),...
0.10*cos(th3)+1.2*sin(th3),...
-0.25*cos(th3)+1.0*sin(th3),...
0.10*cos(th3)+0.8*sin(th3),...
-0.25*cos(th3)+0.6*sin(th3),...
0.10*cos(th3)+0.4*sin(th3),...
-0.03*cos(th3)+0.33*sin(th3),...
-0.03*cos(th3)];

x04=4.0;
y04=0.0;
th4=pi/2;

xres_41=x04+[0.25*sin(th4),0.25*sin(th4)+1.6*cos(th4),...
-0.25*sin(th4)+1.6*cos(th4),-0.25*sin(th4)];
yres_41=y04+[-0.25*cos(th4),-0.25*cos(th4)+1.6*sin(th4),...
0.25*cos(th4)+1.6*sin(th4),0.25*cos(th4)];

xres_42=x04+[-0.03*sin(th4),-0.03*sin(th4)+0.33*cos(th4),...
-0.25*sin(th4)+0.4*cos(th4),...
0.10*sin(th4)+0.6*cos(th4),...
-0.25*sin(th4)+0.8*cos(th4),...
0.10*sin(th4)+1.0*cos(th4),...
-0.25*sin(th4)+1.2*cos(th4),...
-0.03*sin(th4)+1.27*cos(th4),...
-0.03*sin(th4)+1.6*cos(th4),...
0.03*sin(th4)+1.6*cos(th4),...
0.03*sin(th4)+1.27*cos(th4),...
-0.10*sin(th4)+1.2*cos(th4),...
0.25*sin(th4)+1.0*cos(th4),...
-0.10*sin(th4)+0.8*cos(th4),...
0.25*sin(th4)+0.6*cos(th4),...
-0.10*sin(th4)+0.4*cos(th4),...
0.03*sin(th4)+0.33*cos(th4),...
0.03*sin(th4)];
yres_42=y04+[0.03*cos(th4),0.03*cos(th4)+0.33*sin(th4),...
0.25*cos(th4)+0.4*sin(th4),...
-0.10*cos(th4)+0.6*sin(th4),...
0.25*cos(th4)+0.8*sin(th4),...
-0.10*cos(th4)+1.0*sin(th4),...
0.25*cos(th4)+1.2*sin(th4),...
0.03*cos(th4)+1.27*sin(th4),...
0.03*cos(th4)+1.6*sin(th4),...
-0.03*cos(th4)+1.6*sin(th4),...
-0.03*cos(th4)+1.27*sin(th4),...
0.10*cos(th4)+1.2*sin(th4),...
-0.25*cos(th4)+1.0*sin(th4),...
0.10*cos(th4)+0.8*sin(th4),...
-0.25*cos(th4)+0.6*sin(th4),...
0.10*cos(th4)+0.4*sin(th4),...
-0.03*cos(th4)+0.33*sin(th4),...
-0.03*cos(th4)];

x05=-5.5;
y05=0.5;
phi5=0:0.01:2*pi;

xI1_1=x05+0.6*cos(phi5);
yI1_1=y05+0.9*sin(phi5);

xI1_2=x05+0.55*cos(phi5);
yI1_2=y05+0.85*sin(phi5);

xI1_3=x05+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI1_3=y05+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

```

```

x06=8.5;
y06=0.5;

xV1_1=x06+[-1.0,1.0,1.0,-1.0];
yV1_1=y06+[-0.05,-0.05,0.05,0.05]+0.3;

xV1_2=x06+[-0.4,0.4,0.4,-0.4];
yV1_2=y06+[-0.1,-0.1,0.1,0.1]-0.1;

xcable1=[x02,x02,x01,x01];
ycable1=y02+[0.1,-0.1,-0.1,0.1];

xcable2=x01+[-0.05,0.05,0.05,-0.05];
ycable2=[y01+1.6,y01+1.6,y02+0.1,y02+0.1];

xcable3=x01+[-0.05,0.05,0.05,-0.05];
ycable3=[y01,y01,-4.0,-4.0];

xcable4=[x06,x06,x01,x01];
ycable4=-4.0+[0.1,-0.1,-0.1,0.1];

xcable5=x06+[-0.05,0.05,0.05,-0.05];
ycable5=[y06+0.35,y06+0.35,y02+0.1,y02+0.1];

xcable6=x06+[-0.05,0.05,0.05,-0.05];
ycable6=[y06-0.2,y06-0.2,-4.0,-4.0];

xcable7=[x02+1.2,x02+1.2,x06,x06];
ycable7=y02+[0.1,-0.1,-0.1,0.1];

xcable8=x05+[-0.05,0.05,0.05,-0.05];
ycable8=[y05+0.9,y05+0.9,y02+0.1,y02+0.1];

xcable9=x05+[-0.05,0.05,0.05,-0.05];
ycable9=[y05-0.9,y05-0.9,-4.0,-4.0];

xcable10=x03+[-0.05,0.05,0.05,-0.05];
ycable10=[y03+1.6,y03+1.6,y02+0.1,y02+0.1];

xcable11=x03+[-0.05,0.05,0.05,-0.05];
ycable11=[y03,y03,-4.0,-4.0];

xcable12=x04+[-0.05,0.05,0.05,-0.05];
ycable12=[y04+1.6,y04+1.6,y02+0.1,y02+0.1];

xcable13=x04+[-0.05,0.05,0.05,-0.05];
ycable13=[y04,y04,-4.0,-4.0];

xcurrab=x06+[-0.05,0.05,0.05,0.25,0.0,-0.25,-0.05];
ycurrab=y06+1.5+[0.0,0.0,1.0,1.0,1.5,1.0,1.0];

xcurr1=x04+[-0.05,0.05,0.05,0.25,0.0,-0.25,-0.05];
ycurr1=y04+4.0+[0.0,0.0,-1.0,-1.0,-1.5,-1.0,-1.0];

xcurra=x03+[-0.05,0.05,0.05,0.25,0.0,-0.25,-0.05];
ycurra=y03+4.0+[0.0,0.0,-1.0,-1.0,-1.5,-1.0,-1.0];

xcurr2=x04-1.0+[0.0,0.0,-0.7,-0.7,-1.2,-0.7,-0.7];
ycurr2=y02+[-0.1,0.1,0.1,0.4,0.0,-0.4,-0.1];

xcurr3=x03-1.0+[0.0,0.0,-0.7,-0.7,-1.2,-0.7,-0.7];
ycurr3=y02+[-0.1,0.1,0.1,0.4,0.0,-0.4,-0.1];

xcurr4=x05-1.0+[0.0,0.0,-0.7,-0.7,-1.2,-0.7,-0.7];
ycurr4=y02+[-0.1,0.1,0.1,0.4,0.0,-0.4,-0.1];

```

```

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_11,yres_11,[1.0,1.0,1.0],...
xres_12,yres_12,[0.0,0.0,0.0],...

```

```

xres_21,yres_21,[1.0,1.0,1.0],...
xres_22,yres_22,[0.0,0.0,0.0],...
xres_31,yres_31,[1.0,1.0,1.0],...
xres_32,yres_32,[0.0,0.0,0.0],...
xres_41,yres_41,[1.0,1.0,1.0],...
xres_42,yres_42,[0.0,0.0,0.0],...
xI1_1,yI1_1,[0.0,0.0,0.0],...
xI1_2,yI1_2,[1.0,1.0,1.0],...
xI1_3,yI1_3,[0.0,0.0,0.0],...
xV1_1,yV1_1,[0.0,0.0,0.0],...
xV1_2,yV1_2,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
xcable10,ycable10,[0.8,0.6,0.2],...
xcable11,ycable11,[0.8,0.6,0.2],...
xcable12,ycable12,[0.8,0.6,0.2],...
xcable13,ycable13,[0.8,0.6,0.2],...
xcurrab,ycurrab,[0.0,0.0,0.0],...
xcurr1,ycurr1,[0.0,0.0,0.0],...
xcurra,ycurra,[0.0,0.0,0.0],...
xcurr2,ycurr2,[0.0,0.0,0.0],...
xcurr3,ycurr3,[0.0,0.0,0.0],...
xcurr4,ycurr4,[0.0,0.0,0.0],...
'Linestyle','None')

text(-11,11,'Ισχύουν οι σχέσεις  $I_{(1)}=V_{(ab)}/R_{(4)}$ ,  $I_{(2)}=I_{(ab)}-I_{(1)}=I_{(a)}+I_{(3)}$ ,  $I_{(4)}=I_{(3)}-2I_{(a)}$ ,
 $V_{(ab)}=I_{(a)}R_{(3)}$ ,  $V_{(ab)}=I_{(3)}R_{(2)}+I_{(4)}R_{(1)}$ ')
text(4,11,'Από αυτές τις σχέσεις προκύπτει ότι ')
text(-11,10,' $I_{(3)}=I_{(ab)}-V_{(ab)}/(R_{(3)}+R_{(4)})/(R_{(3)}R_{(4)})$  και  $I_{(4)}=I_{(ab)}-V_{(ab)}((3/R_{(3)})+(1/R_{(4)}))$ . Από
αυτές θα έχουμε για την αντίσταση Thevenin του αρχικού κυκλώματος')
text(-11,9,' $R_{(T)}=(V_{(ab)}/I_{(ab)})=(R_{(a)}/R_{(p)})='$ ')
text(-6.8,9.2,nRT)
text(-5.9,9.2,'Ohm.')
```

```

text(x01+0.5,y01+0.8,'R_1','Color',[0.9,0.2,0.0])
text(x02+0.6,y02+1.0,'R_2','Color',[0.9,0.2,0.0])
text(x03+0.5,y03+0.8,'R_3','Color',[0.9,0.2,0.0])
text(x04+0.5,y04+0.8,'R_4','Color',[0.9,0.2,0.0])
text(x05+0.7,y05,'-2I_a','Color',[0.0,0.4,0.4])
text(x06+0.4,y06+1.9,'I_{ab}','Color',[0.0,0.0,0.0])
text(x04+0.4,y04+3.2,'I_{(1)}','Color',[0.0,0.0,0.0])
text(x04-1.4,y02+0.8,'I_{(2)}','Color',[0.0,0.0,0.0])
text(x03+0.4,y03+3.2,'I_{(a)}','Color',[0.0,0.0,0.0])
text(x03-1.4,y02+0.8,'I_{(3)}','Color',[0.0,0.0,0.0])
text(x05-1.4,y02+0.8,'I_{(4)}','Color',[0.0,0.0,0.0])
text(x06+0.4,y06+0.9,'V_{ab}','Color',[0.0,0.2,0.9])
text(x06-2.4,y02+0.8,'a','Color',[0.0,0.0,0.0])
text(x06-2.4,-4.8,'b','Color',[0.0,0.0,0.0])

axis([-12,12,-12,12])
axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
elseif (snmeio==3)
axes(handles.axes1);
cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,7,7];

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
'Linestyle','None')

text(-11,11,'Από το αρχικό κύκλωμα ισχύουν οι εξής σχέσεις:  $V_{(ab)}=(J_{(1)}-I_{(a)})R_{(4)}$ ,
 $V_{(ab)}=R_{(3)}I_{(a)}+V_{(2)}$ ,  $J_{(1)}+J_{(3)}=-2I_{(a)}$ ,  $-R_{(1)}J_{(3)}-V_{(1)}+R_{(3)}I_{(a)}+J_{(1)}R_{(2)}=0$ . ')
text(-11,10,'Από αυτές έχουμε  $(2R_{(1)}+R_{(3)})I_{(a)}+(R_{(1)}+R_{(2)})J_{(1)}=V_{(1)}$ , οπότε θα έχουμε ')
text(0.3,10,' $V_{(ab)}=R_{(4)}(V_{(1)}/(R_{(1)}+R_{(2)})-(2R_{(1)}+R_{(3)})I_{(a)}/(R_{(1)}+R_{(2)})-I_{(a)}=R_{(3)}I_{(a)}+V_{(2)}$ .')
text(-11,9.0,'Τελικά  $I_{(a)}(R_{(3)}+R_{(4)}+(2R_{(1)}+R_{(3)})R_{(4)}/(R_{(1)}+R_{(2)})=R_{(4)}V_{(1)}/(R_{(1)}+R_{(2)})-V_{(2)}$ ,
οπότε')
```

```

        text(1.0,9.0,'I_{a}=')
        text(1.8,9.2,nIa)
        text(2.8,9.2,'Ohm.')
text(-11,8.0,'Τελικά για την τάση Thevenin θα έχουμε  $V_{(T)}=V_{(ab)}=R_{(3)}I_{(a)}+V_{(2)}$ ')
        text(0.0,8.2,nVT)
        text(0.8,8.2,'Volt.')

        axis([-12,12,-12,12])
        axis off;
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

        else
        end

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

% --- Executes on button press in pushbutton4.
function pushbutton4_Callback(hObject, eventdata, handles)
% hObject handle to pushbutton4 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)
hfin=questdlg('Εξοδος από το πρόγραμμα?');
switch hfin
case 'Yes'
closereq;
end

```

Ασκηση 9

```

function varargout = g_asknsn_9(varargin)
% G_ASKNSN_9 M-file for g_asknsn_9.fig
% G_ASKNSN_9, by itself, creates a new G_ASKNSN_9 or raises the existing
% singleton*.
%
% H = G_ASKNSN_9 returns the handle to a new G_ASKNSN_9 or the handle to
% the existing singleton*.
%
% G_ASKNSN_9('CALLBACK',hObject,eventData,handles,...) calls the local
% function named CALLBACK in G_ASKNSN_9.M with the given input arguments.
%
% G_ASKNSN_9('Property','Value',...) creates a new G_ASKNSN_9 or raises the
% existing singleton*. Starting from the left, property value pairs are
% applied to the GUI before g_asknsn_9_OpeningFcn gets called. An
% unrecognized property name or invalid value makes property application
% stop. All inputs are passed to g_asknsn_9_OpeningFcn via varargin.
%
% *See GUI Options on GUIDE's Tools menu. Choose "GUI allows only one
% instance to run (singleton)".
%
% See also: GUIDE, GUIDATA, GUIHANDLES

% Edit the above text to modify the response to help g_asknsn_9

% Last Modified by GUIDE v2.5 20-Dec-2013 04:02:02

% Begin initialization code - DO NOT EDIT
gui_Singleton = 1;
gui_State = struct('gui_Name', mfilename, ...
    'gui_Singleton', gui_Singleton, ...
    'gui_OpeningFcn', @g_asknsn_9_OpeningFcn, ...
    'gui_OutputFcn', @g_asknsn_9_OutputFcn, ...
    'gui_LayoutFcn', [] , ...
    'gui_Callback', []);
if nargin && ischar(varargin{1})
    gui_State.gui_Callback = str2func(varargin{1});
end

if nargout
[varargout{1:nargout}] = gui_mainfcn(gui_State, varargin{:});
else
    gui_mainfcn(gui_State, varargin{:});
end

```

```

% End initialization code - DO NOT EDIT

% --- Executes just before g_asknsn_9 is made visible.
function g_asknsn_9_OpeningFcn(hObject, eventdata, handles, varargin)
% This function has no output args, see OutputFcn.
% hObject handle to figure
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)
% varargin command line arguments to g_asknsn_9 (see VARARGIN)

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,9,9];

x01=-8;
y01=2.5;
th1=0;

xres_11=x01+[0.40*sin(th1),0.40*sin(th1)+1.2*cos(th1),...
-0.40*sin(th1)+1.2*cos(th1),-0.40*sin(th1)];
yres_11=y01+[-0.40*cos(th1),-0.40*cos(th1)+1.2*sin(th1),...
0.40*cos(th1)+1.2*sin(th1),0.40*cos(th1)];

xres_12=x01+[-0.05*sin(th1),-0.05*sin(th1)+0.25*cos(th1),...
-0.40*sin(th1)+0.3*cos(th1),...
0.25*sin(th1)+0.45*cos(th1),...
-0.40*sin(th1)+0.6*cos(th1),...
0.25*sin(th1)+0.75*cos(th1),...
-0.40*sin(th1)+0.9*cos(th1),...
-0.05*sin(th1)+0.95*cos(th1),...
-0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+0.95*cos(th1),...
-0.25*sin(th1)+0.9*cos(th1),...
0.40*sin(th1)+0.75*cos(th1),...
-0.25*sin(th1)+0.6*cos(th1),...
0.40*sin(th1)+0.45*cos(th1),...
-0.25*sin(th1)+0.3*cos(th1),...
0.05*sin(th1)+0.25*cos(th1),...
0.05*sin(th1)];
yres_12=y01+[0.05*cos(th1),0.05*cos(th1)+0.25*sin(th1),...
0.40*cos(th1)+0.3*sin(th1),...
-0.25*cos(th1)+0.45*sin(th1),...
0.40*cos(th1)+0.6*sin(th1),...
-0.250*cos(th1)+0.75*sin(th1),...
0.40*cos(th1)+0.9*sin(th1),...
0.05*cos(th1)+0.95*sin(th1),...
0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+0.95*sin(th1),...
0.25*cos(th1)+0.9*sin(th1),...
-0.40*cos(th1)+0.75*sin(th1),...
0.25*cos(th1)+0.6*sin(th1),...
-0.40*cos(th1)+0.45*sin(th1),...
0.25*cos(th1)+0.3*sin(th1),...
-0.05*cos(th1)+0.25*sin(th1),...
-0.05*cos(th1)];

x02=-3;
y02=2.5;
th2=0;

xres_21=x02+[0.40*sin(th2),0.40*sin(th2)+1.2*cos(th2),...
-0.40*sin(th2)+1.2*cos(th2),-0.40*sin(th2)];
yres_21=y02+[-0.40*cos(th2),-0.40*cos(th2)+1.2*sin(th2),...
0.40*cos(th2)+1.2*sin(th2),0.40*cos(th2)];

xres_22=x02+[-0.05*sin(th2),-0.05*sin(th2)+0.25*cos(th2),...
-0.40*sin(th2)+0.3*cos(th2),...
0.25*sin(th2)+0.45*cos(th2),...
-0.40*sin(th2)+0.6*cos(th2),...
0.25*sin(th2)+0.75*cos(th2),...
-0.40*sin(th2)+0.9*cos(th2),...
-0.05*sin(th2)+0.95*cos(th2),...
-0.05*sin(th2)+1.2*cos(th2),...
0.05*sin(th2)+1.2*cos(th2),...
0.05*sin(th2)+0.95*cos(th2),...

```



```

-0.25*sin(th2)+0.9*cos(th2),...
0.40*sin(th2)+0.75*cos(th2),...
-0.25*sin(th2)+0.6*cos(th2),...
0.40*sin(th2)+0.45*cos(th2),...
-0.25*sin(th2)+0.3*cos(th2),...
0.05*sin(th2)+0.25*cos(th2),...
0.05*sin(th2)];
yres_22=y02+[0.05*cos(th2),0.05*cos(th2)+0.25*sin(th2),...
0.40*cos(th2)+0.3*sin(th2),...
-0.25*cos(th2)+0.45*sin(th2),...
0.40*cos(th2)+0.6*sin(th2),...
-0.250*cos(th2)+0.75*sin(th2),...
0.40*cos(th2)+0.9*sin(th2),...
0.05*cos(th2)+0.95*sin(th2),...
0.05*cos(th2)+1.2*sin(th2),...
-0.05*cos(th2)+1.2*sin(th2),...
-0.05*cos(th2)+0.95*sin(th2),...
0.25*cos(th2)+0.9*sin(th2),...
-0.40*cos(th2)+0.75*sin(th2),...
0.25*cos(th2)+0.6*sin(th2),...
-0.40*cos(th2)+0.45*sin(th2),...
0.25*cos(th2)+0.3*sin(th2),...
-0.05*cos(th2)+0.25*sin(th2),...
-0.05*cos(th2)];

x03=2;
y03=6.5;
th3=0;

xres_31=x03+[0.40*sin(th3),0.40*sin(th3)+1.2*cos(th3),...
-0.40*sin(th3)+1.2*cos(th3),-0.40*sin(th3)];
yres_31=y03+[-0.40*cos(th3),-0.40*cos(th3)+1.2*sin(th3),...
0.40*cos(th3)+1.2*sin(th3),0.40*cos(th3)];

xres_32=x03+[-0.05*sin(th3),-0.05*sin(th3)+0.25*cos(th3),...
-0.40*sin(th3)+0.3*cos(th3),...
0.25*sin(th3)+0.45*cos(th3),...
-0.40*sin(th3)+0.6*cos(th3),...
0.25*sin(th3)+0.75*cos(th3),...
-0.40*sin(th3)+0.9*cos(th3),...
-0.05*sin(th3)+0.95*cos(th3),...
-0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+0.95*cos(th3),...
-0.25*sin(th3)+0.9*cos(th3),...
0.40*sin(th3)+0.75*cos(th3),...
-0.25*sin(th3)+0.6*cos(th3),...
0.40*sin(th3)+0.45*cos(th3),...
-0.25*sin(th3)+0.3*cos(th3),...
0.05*sin(th3)+0.25*cos(th3),...
0.05*sin(th3)];
yres_32=y03+[0.05*cos(th3),0.05*cos(th3)+0.25*sin(th3),...
0.40*cos(th3)+0.3*sin(th3),...
-0.25*cos(th3)+0.45*sin(th3),...
0.40*cos(th3)+0.6*sin(th3),...
-0.250*cos(th3)+0.75*sin(th3),...
0.40*cos(th3)+0.9*sin(th3),...
0.05*cos(th3)+0.95*sin(th3),...
0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+0.95*sin(th3),...
0.25*cos(th3)+0.9*sin(th3),...
-0.40*cos(th3)+0.75*sin(th3),...
0.25*cos(th3)+0.6*sin(th3),...
-0.40*cos(th3)+0.45*sin(th3),...
0.25*cos(th3)+0.3*sin(th3),...
-0.05*cos(th3)+0.25*sin(th3),...
-0.05*cos(th3)];

x04=5;
y04=2.5;
th4=0;

xres_41=x04+[0.40*sin(th4),0.40*sin(th4)+1.2*cos(th4),...
-0.40*sin(th4)+1.2*cos(th4),-0.40*sin(th4)];
yres_41=y04+[-0.40*cos(th4),-0.40*cos(th4)+1.2*sin(th4),...
0.40*cos(th4)+1.2*sin(th4),0.40*cos(th4)];

xres_42=x04+[-0.05*sin(th4),-0.05*sin(th4)+0.25*cos(th4),...
-0.40*sin(th4)+0.3*cos(th4),...

```

```

0.25*sin(th4)+0.45*cos(th4),...
-0.40*sin(th4)+0.6*cos(th4),...
0.25*sin(th4)+0.75*cos(th4),...
-0.40*sin(th4)+0.9*cos(th4),...
-0.05*sin(th4)+0.95*cos(th4),...
-0.05*sin(th4)+1.2*cos(th4),...
0.05*sin(th4)+1.2*cos(th4),...
0.05*sin(th4)+0.95*cos(th4),...
-0.25*sin(th4)+0.9*cos(th4),...
0.40*sin(th4)+0.75*cos(th4),...
-0.25*sin(th4)+0.6*cos(th4),...
0.40*sin(th4)+0.45*cos(th4),...
-0.25*sin(th4)+0.3*cos(th4),...
0.05*sin(th4)+0.25*cos(th4),...
0.05*sin(th4)];
yres_42=y04+[0.05*cos(th4),0.05*cos(th4)+0.25*sin(th4),...
0.40*cos(th4)+0.3*sin(th4),...
-0.25*cos(th4)+0.45*sin(th4),...
0.40*cos(th4)+0.6*sin(th4),...
-0.250*cos(th4)+0.75*sin(th4),...
0.40*cos(th4)+0.9*sin(th4),...
0.05*cos(th4)+0.95*sin(th4),...
0.05*cos(th4)+1.2*sin(th4),...
-0.05*cos(th4)+1.2*sin(th4),...
-0.05*cos(th4)+0.95*sin(th4),...
0.25*cos(th4)+0.9*sin(th4),...
-0.40*cos(th4)+0.75*sin(th4),...
0.25*cos(th4)+0.6*sin(th4),...
-0.40*cos(th4)+0.45*sin(th4),...
0.25*cos(th4)+0.3*sin(th4),...
-0.05*cos(th4)+0.25*sin(th4),...
-0.05*cos(th4)];

x05=3.0;
y05=-3.0;
th5=pi/2;

xres_51=x05+[0.25*sin(th5),0.25*sin(th5)+1.6*cos(th5),...
-0.25*sin(th5)+1.6*cos(th5),-0.25*sin(th5)];
yres_51=y05+[-0.25*cos(th5),-0.25*cos(th5)+1.6*sin(th5),...
0.25*cos(th5)+1.6*sin(th5),0.25*cos(th5)];

xres_52=x05+[-0.03*sin(th5),-0.03*sin(th5)+0.33*cos(th5),...
-0.25*sin(th5)+0.4*cos(th5),...
0.10*sin(th5)+0.6*cos(th5),...
-0.25*sin(th5)+0.8*cos(th5),...
0.10*sin(th5)+1.0*cos(th5),...
-0.25*sin(th5)+1.2*cos(th5),...
-0.03*sin(th5)+1.27*cos(th5),...
-0.03*sin(th5)+1.6*cos(th5),...
0.03*sin(th5)+1.6*cos(th5),...
0.03*sin(th5)+1.27*cos(th5),...
-0.10*sin(th5)+1.2*cos(th5),...
0.25*sin(th5)+1.0*cos(th5),...
-0.10*sin(th5)+0.8*cos(th5),...
0.25*sin(th5)+0.6*cos(th5),...
-0.10*sin(th5)+0.4*cos(th5),...
0.03*sin(th5)+0.33*cos(th5),...
0.03*sin(th5)];
yres_52=y05+[0.03*cos(th5),0.03*cos(th5)+0.33*sin(th5),...
0.25*cos(th5)+0.4*sin(th5),...
-0.10*cos(th5)+0.6*sin(th5),...
0.25*cos(th5)+0.8*sin(th5),...
-0.10*cos(th5)+1.0*sin(th5),...
0.25*cos(th5)+1.2*sin(th5),...
0.03*cos(th5)+1.27*sin(th5),...
0.03*cos(th5)+1.6*sin(th5),...
-0.03*cos(th5)+1.6*sin(th5),...
-0.03*cos(th5)+1.27*sin(th5),...
0.10*cos(th5)+1.2*sin(th5),...
-0.25*cos(th5)+1.0*sin(th5),...
0.10*cos(th5)+0.8*sin(th5),...
-0.25*cos(th5)+0.6*sin(th5),...
0.10*cos(th5)+0.4*sin(th5),...
-0.03*cos(th5)+0.33*sin(th5),...
-0.03*cos(th5)];

x06=-9.5;
y06=-2.5;
phi6=0:0.01:2*pi;

```

```

xI1_1=x06+0.6*cos(phi6);
yI1_1=y06+0.9*sin(phi6);

xI1_2=x06+0.55*cos(phi6);
yI1_2=y06+0.85*sin(phi6);

xI1_3=x06+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI1_3=y06+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

x07=1.5;
y07=2.5;
phi7=0:0.01:2*pi;

xI2_1=x07+0.6*cos(phi7);
yI2_1=y07+0.9*sin(phi7);

xI2_2=x07+0.55*cos(phi7);
yI2_2=y07+0.85*sin(phi7);

yI2_3=y07+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
xI2_3=x07+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

x08=-4.5;
y08=-2.5;

xV1_1=x08+[-1.0,1.0,1.0,-1.0];
yV1_1=y08+[-0.05,-0.05,0.05,0.05]+0.3;

xV1_2=x08+[-0.4,0.4,0.4,-0.4];
yV1_2=y08+[-0.1,-0.1,0.1,0.1]-0.1;

xcable1=[-9.5,-9.5,x01,x01];
ycable1=y01+[0.1,-0.1,-0.1,0.1];

xcable2=[-9.55,-9.45,-9.45,-9.55];
ycable2=[y01+0.1,y01+0.1,y06+0.9,y06+0.9];

xcable3=[-9.55,-9.45,-9.45,-9.55];
ycable3=[-7.0,-7.0,y06-0.9,y06-0.9];

xcable4=[-9.5,-9.5,9.0,9.0];
ycable4=-7.0+[0.1,-0.1,-0.1,0.1];

xcable5=[x04+1.2,x04+1.2,9.0,9.0];
ycable5=y01+[0.1,-0.1,-0.1,0.1];

xcable6=[x04,x04,x07+0.6,x07+0.6];
ycable6=y01+[0.1,-0.1,-0.1,0.1];

xcable7=[x02+1.2,x02+1.2,x07-0.6,x07-0.6];
ycable7=y01+[0.1,-0.1,-0.1,0.1];

xcable8=[x02,x02,x01+1.2,x01+1.2];
ycable8=y01+[0.1,-0.1,-0.1,0.1];

xcable9=x08+[-0.05,0.05,0.05,-0.05];
ycable9=[y01+0.1,y01+0.1,y08+0.35,y08+0.35];

xcable10=x08+[-0.05,0.05,0.05,-0.05];
ycable10=[-7.0,-7.0,y08-0.2,y08-0.2];

xcable11=x05+[-0.05,0.05,0.05,-0.05];
ycable11=[y01+0.1,y01+0.1,y05+1.6,y05+1.6];

xcable12=x05+[-0.05,0.05,0.05,-0.05];
ycable12=[-7.0,-7.0,y05,y05];

xcable13=[x07-2.0,x07-2.0,x03,x03];
ycable13=y03+[0.1,-0.1,-0.1,0.1];

xcable14=[x04+2.0,x04+2.0,x03+1.2,x03+1.2];
ycable14=y03+[0.1,-0.1,-0.1,0.1];

xcable15=x07-2.0+[-0.05,0.05,0.05,-0.05];
ycable15=[y01+0.1,y01+0.1,y03+0.1,y03+0.1];

xcable16=x04+2.0+[-0.05,0.05,0.05,-0.05];
ycable16=[y01+0.1,y01+0.1,y03+0.1,y03+0.1];

```

```
xcurr1=x08+[-0.05,0.05,0.05,0.25,0.0,-0.25,-0.05];
ycurr1=y08+2.5+[0.0,0.0,0.9,0.9,1.4,0.9,0.9];
```

```
fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_11,yres_11,[1.0,1.0,1.0],...
xres_12,yres_12,[0.0,0.0,0.0],...
xres_21,yres_21,[1.0,1.0,1.0],...
xres_22,yres_22,[0.0,0.0,0.0],...
xres_31,yres_31,[1.0,1.0,1.0],...
xres_32,yres_32,[0.0,0.0,0.0],...
xres_41,yres_41,[1.0,1.0,1.0],...
xres_42,yres_42,[0.0,0.0,0.0],...
xres_51,yres_51,[1.0,1.0,1.0],...
xres_52,yres_52,[0.0,0.0,0.0],...
xi1_1,yi1_1,[0.0,0.0,0.0],...
xi1_2,yi1_2,[1.0,1.0,1.0],...
xi1_3,yi1_3,[0.0,0.0,0.0],...
xi2_1,yi2_1,[0.0,0.0,0.0],...
xi2_2,yi2_2,[1.0,1.0,1.0],...
xi2_3,yi2_3,[0.0,0.0,0.0],...
xv1_1,yv1_1,[0.0,0.0,0.0],...
xv1_2,yv1_2,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
xcable10,ycable10,[0.8,0.6,0.2],...
xcable11,ycable11,[0.8,0.6,0.2],...
xcable12,ycable12,[0.8,0.6,0.2],...
xcable13,ycable13,[0.8,0.6,0.2],...
xcable14,ycable14,[0.8,0.6,0.2],...
xcable15,ycable15,[0.8,0.6,0.2],...
xcable16,ycable16,[0.8,0.6,0.2],...
xcurr1,ycurr1,[0.0,0.0,0.0],...
'LineStyle','None')
```

```
text(-11,11,'Να υπολογιστεί το ισοδύναμο κατά Thevenin του παρακάτω κυκλώματος από τα άκρα a, b.')
```

```
text(x01+0.5,y01+1.0,'R_1','Color',[0.9,0.2,0.0])
text(x02+0.5,y02+1.0,'R_2','Color',[0.9,0.2,0.0])
text(x03+0.5,y03+1.0,'R_3','Color',[0.9,0.2,0.0])
text(x04+0.5,y04+0.8,'R_4','Color',[0.9,0.2,0.0])
text(x05+0.5,y05+0.8,'R_5','Color',[0.9,0.2,0.0])
text(x06+0.7,y06,'J_1','Color',[0.0,0.4,0.4])
text(x07-0.1,y07-1.7,'2I_1','Color',[0.0,0.4,0.4])
text(x08+0.3,y08+3.0,'I_1','Color',[0.0,0.4,0.4])
text(x08+0.5,y08+1.0,'V_1','Color',[0.0,0.2,0.9])
text(9.5,y01,'a','Color',[0.0,0.0,0.0])
text(9.5,-7.0,'b','Color',[0.0,0.0,0.0])
```

```
axis([-12,12,-12,12])
axis off;
```

```
#####
#####
```

```
% Choose default command line output for g_asknsn_9
handles.output = hObject;
```

```
% Update handles structure
guidata(hObject, handles);
```

```
% UIWAIT makes g_asknsn_9 wait for user response (see UIRESUME)
% uiwait(handles.figure1);
```

```
% --- Outputs from this function are returned to the command line.
function varargout = g_asknsn_9_OutputFcn(hObject, eventdata, handles)
% varargout cell array for returning output args (see VARARGOUT);
% hObject handle to figure
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)
```

```

        % Get default command line output from handles structure
        varargout{1} = handles.output;

        function edit1_Callback(hObject, eventdata, handles)
            % hObject    handle to edit1 (see GCBO)
            % eventdata reserved - to be defined in a future version of MATLAB
            % handles    structure with handles and user data (see GUIDATA)

            % Hints: get(hObject,'String') returns contents of edit1 as text
            % str2double(get(hObject,'String')) returns contents of edit1 as a double

            % --- Executes during object creation, after setting all properties.
            function edit1_CreateFcn(hObject, eventdata, handles)
                % hObject    handle to edit1 (see GCBO)
                % eventdata reserved - to be defined in a future version of MATLAB
                % handles    empty - handles not created until after all CreateFcns called

                % Hint: edit controls usually have a white background on Windows.
                %         See ISPC and COMPUTER.
                if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
                    set(hObject,'BackgroundColor','white');
                end

            function edit2_Callback(hObject, eventdata, handles)
                % hObject    handle to edit2 (see GCBO)
                % eventdata reserved - to be defined in a future version of MATLAB
                % handles    structure with handles and user data (see GUIDATA)

                % Hints: get(hObject,'String') returns contents of edit2 as text
                % str2double(get(hObject,'String')) returns contents of edit2 as a double

                % --- Executes during object creation, after setting all properties.
                function edit2_CreateFcn(hObject, eventdata, handles)
                    % hObject    handle to edit2 (see GCBO)
                    % eventdata reserved - to be defined in a future version of MATLAB
                    % handles    empty - handles not created until after all CreateFcns called

                    % Hint: edit controls usually have a white background on Windows.
                    %         See ISPC and COMPUTER.
                    if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
                        set(hObject,'BackgroundColor','white');
                    end

                function edit3_Callback(hObject, eventdata, handles)
                    % hObject    handle to edit3 (see GCBO)
                    % eventdata reserved - to be defined in a future version of MATLAB
                    % handles    structure with handles and user data (see GUIDATA)

                    % Hints: get(hObject,'String') returns contents of edit3 as text
                    % str2double(get(hObject,'String')) returns contents of edit3 as a double

                    % --- Executes during object creation, after setting all properties.
                    function edit3_CreateFcn(hObject, eventdata, handles)
                        % hObject    handle to edit3 (see GCBO)
                        % eventdata reserved - to be defined in a future version of MATLAB
                        % handles    empty - handles not created until after all CreateFcns called

                        % Hint: edit controls usually have a white background on Windows.
                        %         See ISPC and COMPUTER.
                        if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
                            set(hObject,'BackgroundColor','white');
                        end

                    function edit4_Callback(hObject, eventdata, handles)
                        % hObject    handle to edit4 (see GCBO)
                        % eventdata reserved - to be defined in a future version of MATLAB
                        % handles    structure with handles and user data (see GUIDATA)

                        % Hints: get(hObject,'String') returns contents of edit4 as text

```

```

%         str2double(get(hObject,'String')) returns contents of edit4 as a double

% --- Executes during object creation, after setting all properties.
function edit4_CreateFcn(hObject, eventdata, handles)
    % hObject    handle to edit4 (see GCBO)
    % eventdata reserved - to be defined in a future version of MATLAB
    % handles    empty - handles not created until after all CreateFcns called

    % Hint: edit controls usually have a white background on Windows.
    %         See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit5_Callback(hObject, eventdata, handles)
    % hObject    handle to edit5 (see GCBO)
    % eventdata reserved - to be defined in a future version of MATLAB
    % handles    structure with handles and user data (see GUIDATA)

    % Hints: get(hObject,'String') returns contents of edit5 as text
    %         str2double(get(hObject,'String')) returns contents of edit5 as a double

% --- Executes during object creation, after setting all properties.
function edit5_CreateFcn(hObject, eventdata, handles)
    % hObject    handle to edit5 (see GCBO)
    % eventdata reserved - to be defined in a future version of MATLAB
    % handles    empty - handles not created until after all CreateFcns called

    % Hint: edit controls usually have a white background on Windows.
    %         See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit6_Callback(hObject, eventdata, handles)
    % hObject    handle to edit6 (see GCBO)
    % eventdata reserved - to be defined in a future version of MATLAB
    % handles    structure with handles and user data (see GUIDATA)

    % Hints: get(hObject,'String') returns contents of edit6 as text
    %         str2double(get(hObject,'String')) returns contents of edit6 as a double

% --- Executes during object creation, after setting all properties.
function edit6_CreateFcn(hObject, eventdata, handles)
    % hObject    handle to edit6 (see GCBO)
    % eventdata reserved - to be defined in a future version of MATLAB
    % handles    empty - handles not created until after all CreateFcns called

    % Hint: edit controls usually have a white background on Windows.
    %         See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit7_Callback(hObject, eventdata, handles)
    % hObject    handle to edit7 (see GCBO)
    % eventdata reserved - to be defined in a future version of MATLAB
    % handles    structure with handles and user data (see GUIDATA)

    % Hints: get(hObject,'String') returns contents of edit7 as text
    %         str2double(get(hObject,'String')) returns contents of edit7 as a double

% --- Executes during object creation, after setting all properties.
function edit7_CreateFcn(hObject, eventdata, handles)
    % hObject    handle to edit7 (see GCBO)
    % eventdata reserved - to be defined in a future version of MATLAB
    % handles    empty - handles not created until after all CreateFcns called

    % Hint: edit controls usually have a white background on Windows.
    %         See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'), get(0,'defaultUicontrolBackgroundColor'))

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set(hObject,'BackgroundColor','white');
end

% --- Executes on button press in pushbutton1.
function pushbutton1_Callback(hObject, eventdata, handles)
% hObject handle to pushbutton1 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
global R1;
global R2;
global R3;
global R4;
global R5;
global V1;
global J1;

R1=str2double(get(handles.edit1,'String'));
R2=str2double(get(handles.edit2,'String'));
R3=str2double(get(handles.edit3,'String'));
R4=str2double(get(handles.edit4,'String'));
R5=str2double(get(handles.edit5,'String'));
V1=str2double(get(handles.edit6,'String'));
J1=str2double(get(handles.edit7,'String'));

if (R1>10|R1<1)
h=warndlg('Βάλτε στην αντίσταση R1 τιμή μεταξύ 1 και 10');
return
end

if (R2>10|R2<1)
h=warndlg('Βάλτε στην αντίσταση R2 τιμή μεταξύ 1 και 10');
return
end

if (R3>10|R3<1)
h=warndlg('Βάλτε στην αντίσταση R3 τιμή μεταξύ 1 και 10');
return
end

if (R4>10|R4<1)
h=warndlg('Βάλτε στην αντίσταση R4 τιμή μεταξύ 1 και 10');
return
end

if (R5>10|R5<1)
h=warndlg('Βάλτε στην αντίσταση R5 τιμή μεταξύ 1 και 10');
return
end

if (V1>15|V1<5)
h=warndlg('Βάλτε στην τάση V1 τιμή μεταξύ 5 και 15');
return
end

if (J1>5|J1<1)
h=warndlg('Βάλτε στο ρεύμα J1 τιμή μεταξύ 1 και 5');
return
end

axes(handles.axes1)
axis off;
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
global snmeio;

snmeio=1;
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,9,9];

x01=-8;
y01=2.5;
th1=0;

xres_11=x01+[0.40*sin(th1),0.40*sin(th1)+1.2*cos(th1),...
-0.40*sin(th1)+1.2*cos(th1),-0.40*sin(th1)];

```

```

yres_11=y01+[-0.40*cos(th1),-0.40*cos(th1)+1.2*sin(th1),...
             0.40*cos(th1)+1.2*sin(th1),0.40*cos(th1)];

xres_12=x01+[-0.05*sin(th1),-0.05*sin(th1)+0.25*cos(th1),...
             -0.40*sin(th1)+0.3*cos(th1),...
             0.25*sin(th1)+0.45*cos(th1),...
             -0.40*sin(th1)+0.6*cos(th1),...
             0.25*sin(th1)+0.75*cos(th1),...
             -0.40*sin(th1)+0.9*cos(th1),...
             -0.05*sin(th1)+0.95*cos(th1),...
             -0.05*sin(th1)+1.2*cos(th1),...
             0.05*sin(th1)+1.2*cos(th1),...
             0.05*sin(th1)+0.95*cos(th1),...
             -0.25*sin(th1)+0.9*cos(th1),...
             0.40*sin(th1)+0.75*cos(th1),...
             -0.25*sin(th1)+0.6*cos(th1),...
             0.40*sin(th1)+0.45*cos(th1),...
             -0.25*sin(th1)+0.3*cos(th1),...
             0.05*sin(th1)+0.25*cos(th1),...
             0.05*sin(th1)];

yres_12=y01+[0.05*cos(th1),0.05*cos(th1)+0.25*sin(th1),...
             0.40*cos(th1)+0.3*sin(th1),...
             -0.25*cos(th1)+0.45*sin(th1),...
             0.40*cos(th1)+0.6*sin(th1),...
             -0.250*cos(th1)+0.75*sin(th1),...
             0.40*cos(th1)+0.9*sin(th1),...
             0.05*cos(th1)+0.95*sin(th1),...
             0.05*cos(th1)+1.2*sin(th1),...
             -0.05*cos(th1)+1.2*sin(th1),...
             -0.05*cos(th1)+0.95*sin(th1),...
             0.25*cos(th1)+0.9*sin(th1),...
             -0.40*cos(th1)+0.75*sin(th1),...
             0.25*cos(th1)+0.6*sin(th1),...
             -0.40*cos(th1)+0.45*sin(th1),...
             0.25*cos(th1)+0.3*sin(th1),...
             -0.05*cos(th1)+0.25*sin(th1),...
             -0.05*cos(th1)];

             x02=-3;
             y02=2.5;
             th2=0;

xres_21=x02+[0.40*sin(th2),0.40*sin(th2)+1.2*cos(th2),...
             -0.40*sin(th2)+1.2*cos(th2),-0.40*sin(th2)];
yres_21=y02+[-0.40*cos(th2),-0.40*cos(th2)+1.2*sin(th2),...
             0.40*cos(th2)+1.2*sin(th2),0.40*cos(th2)];

xres_22=x02+[-0.05*sin(th2),-0.05*sin(th2)+0.25*cos(th2),...
             -0.40*sin(th2)+0.3*cos(th2),...
             0.25*sin(th2)+0.45*cos(th2),...
             -0.40*sin(th2)+0.6*cos(th2),...
             0.25*sin(th2)+0.75*cos(th2),...
             -0.40*sin(th2)+0.9*cos(th2),...
             -0.05*sin(th2)+0.95*cos(th2),...
             -0.05*sin(th2)+1.2*cos(th2),...
             0.05*sin(th2)+1.2*cos(th2),...
             0.05*sin(th2)+0.95*cos(th2),...
             -0.25*sin(th2)+0.9*cos(th2),...
             0.40*sin(th2)+0.75*cos(th2),...
             -0.25*sin(th2)+0.6*cos(th2),...
             0.40*sin(th2)+0.45*cos(th2),...
             -0.25*sin(th2)+0.3*cos(th2),...
             0.05*sin(th2)+0.25*cos(th2),...
             0.05*sin(th2)];

yres_22=y02+[0.05*cos(th2),0.05*cos(th2)+0.25*sin(th2),...
             0.40*cos(th2)+0.3*sin(th2),...
             -0.25*cos(th2)+0.45*sin(th2),...
             0.40*cos(th2)+0.6*sin(th2),...
             -0.250*cos(th2)+0.75*sin(th2),...
             0.40*cos(th2)+0.9*sin(th2),...
             0.05*cos(th2)+0.95*sin(th2),...
             0.05*cos(th2)+1.2*sin(th2),...
             -0.05*cos(th2)+1.2*sin(th2),...
             -0.05*cos(th2)+0.95*sin(th2),...
             0.25*cos(th2)+0.9*sin(th2),...
             -0.40*cos(th2)+0.75*sin(th2),...
             0.25*cos(th2)+0.6*sin(th2),...
             -0.40*cos(th2)+0.45*sin(th2),...
             0.25*cos(th2)+0.3*sin(th2),...
             -0.05*cos(th2)+0.25*sin(th2),...
             -0.05*cos(th2)];

```



```

x03=2;
y03=6.5;
th3=0;

xres_31=x03+[0.40*sin(th3),0.40*sin(th3)+1.2*cos(th3),...
-0.40*sin(th3)+1.2*cos(th3),-0.40*sin(th3)];
yres_31=y03+[-0.40*cos(th3),-0.40*cos(th3)+1.2*sin(th3),...
0.40*cos(th3)+1.2*sin(th3),0.40*cos(th3)];

xres_32=x03+[-0.05*sin(th3),-0.05*sin(th3)+0.25*cos(th3),...
-0.40*sin(th3)+0.3*cos(th3),...
0.25*sin(th3)+0.45*cos(th3),...
-0.40*sin(th3)+0.6*cos(th3),...
0.25*sin(th3)+0.75*cos(th3),...
-0.40*sin(th3)+0.9*cos(th3),...
-0.05*sin(th3)+0.95*cos(th3),...
-0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+0.95*cos(th3),...
-0.25*sin(th3)+0.9*cos(th3),...
0.40*sin(th3)+0.75*cos(th3),...
-0.25*sin(th3)+0.6*cos(th3),...
0.40*sin(th3)+0.45*cos(th3),...
-0.25*sin(th3)+0.3*cos(th3),...
0.05*sin(th3)+0.25*cos(th3),...
0.05*sin(th3)];
yres_32=y03+[0.05*cos(th3),0.05*cos(th3)+0.25*sin(th3),...
0.40*cos(th3)+0.3*sin(th3),...
-0.25*cos(th3)+0.45*sin(th3),...
0.40*cos(th3)+0.6*sin(th3),...
-0.250*cos(th3)+0.75*sin(th3),...
0.40*cos(th3)+0.9*sin(th3),...
0.05*cos(th3)+0.95*sin(th3),...
0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+0.95*sin(th3),...
0.25*cos(th3)+0.9*sin(th3),...
-0.40*cos(th3)+0.75*sin(th3),...
0.25*cos(th3)+0.6*sin(th3),...
-0.40*cos(th3)+0.45*sin(th3),...
0.25*cos(th3)+0.3*sin(th3),...
-0.05*cos(th3)+0.25*sin(th3),...
-0.05*cos(th3)];

x04=5;
y04=2.5;
th4=0;

xres_41=x04+[0.40*sin(th4),0.40*sin(th4)+1.2*cos(th4),...
-0.40*sin(th4)+1.2*cos(th4),-0.40*sin(th4)];
yres_41=y04+[-0.40*cos(th4),-0.40*cos(th4)+1.2*sin(th4),...
0.40*cos(th4)+1.2*sin(th4),0.40*cos(th4)];

xres_42=x04+[-0.05*sin(th4),-0.05*sin(th4)+0.25*cos(th4),...
-0.40*sin(th4)+0.3*cos(th4),...
0.25*sin(th4)+0.45*cos(th4),...
-0.40*sin(th4)+0.6*cos(th4),...
0.25*sin(th4)+0.75*cos(th4),...
-0.40*sin(th4)+0.9*cos(th4),...
-0.05*sin(th4)+0.95*cos(th4),...
-0.05*sin(th4)+1.2*cos(th4),...
0.05*sin(th4)+1.2*cos(th4),...
0.05*sin(th4)+0.95*cos(th4),...
-0.25*sin(th4)+0.9*cos(th4),...
0.40*sin(th4)+0.75*cos(th4),...
-0.25*sin(th4)+0.6*cos(th4),...
0.40*sin(th4)+0.45*cos(th4),...
-0.25*sin(th4)+0.3*cos(th4),...
0.05*sin(th4)+0.25*cos(th4),...
0.05*sin(th4)];
yres_42=y04+[0.05*cos(th4),0.05*cos(th4)+0.25*sin(th4),...
0.40*cos(th4)+0.3*sin(th4),...
-0.25*cos(th4)+0.45*sin(th4),...
0.40*cos(th4)+0.6*sin(th4),...
-0.250*cos(th4)+0.75*sin(th4),...
0.40*cos(th4)+0.9*sin(th4),...
0.05*cos(th4)+0.95*sin(th4),...
0.05*cos(th4)+1.2*sin(th4),...
-0.05*cos(th4)+1.2*sin(th4),...

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-0.05*cos(th4)+0.95*sin(th4),...
0.25*cos(th4)+0.9*sin(th4),...
-0.40*cos(th4)+0.75*sin(th4),...
0.25*cos(th4)+0.6*sin(th4),...
-0.40*cos(th4)+0.45*sin(th4),...
0.25*cos(th4)+0.3*sin(th4),...
-0.05*cos(th4)+0.25*sin(th4),...
-0.05*cos(th4)];

x05=3.0;
y05=-3.0;
th5=pi/2;

xres_51=x05+[0.25*sin(th5),0.25*sin(th5)+1.6*cos(th5),...
-0.25*sin(th5)+1.6*cos(th5),-0.25*sin(th5)];
yres_51=y05+[-0.25*cos(th5),-0.25*cos(th5)+1.6*sin(th5),...
0.25*cos(th5)+1.6*sin(th5),0.25*cos(th5)];

xres_52=x05+[-0.03*sin(th5),-0.03*sin(th5)+0.33*cos(th5),...
-0.25*sin(th5)+0.4*cos(th5),...
0.10*sin(th5)+0.6*cos(th5),...
-0.25*sin(th5)+0.8*cos(th5),...
0.10*sin(th5)+1.0*cos(th5),...
-0.25*sin(th5)+1.2*cos(th5),...
-0.03*sin(th5)+1.27*cos(th5),...
-0.03*sin(th5)+1.6*cos(th5),...
0.03*sin(th5)+1.6*cos(th5),...
0.03*sin(th5)+1.27*cos(th5),...
-0.10*sin(th5)+1.2*cos(th5),...
0.25*sin(th5)+1.0*cos(th5),...
-0.10*sin(th5)+0.8*cos(th5),...
0.25*sin(th5)+0.6*cos(th5),...
-0.10*sin(th5)+0.4*cos(th5),...
0.03*sin(th5)+0.33*cos(th5),...
0.03*sin(th5)];
yres_52=y05+[0.03*cos(th5),0.03*cos(th5)+0.33*sin(th5),...
0.25*cos(th5)+0.4*sin(th5),...
-0.10*cos(th5)+0.6*sin(th5),...
0.25*cos(th5)+0.8*sin(th5),...
-0.10*cos(th5)+1.0*sin(th5),...
0.25*cos(th5)+1.2*sin(th5),...
0.03*cos(th5)+1.27*sin(th5),...
0.03*cos(th5)+1.6*sin(th5),...
-0.03*cos(th5)+1.6*sin(th5),...
-0.03*cos(th5)+1.27*sin(th5),...
0.10*cos(th5)+1.2*sin(th5),...
-0.25*cos(th5)+1.0*sin(th5),...
0.10*cos(th5)+0.8*sin(th5),...
-0.25*cos(th5)+0.6*sin(th5),...
0.10*cos(th5)+0.4*sin(th5),...
-0.03*cos(th5)+0.33*sin(th5),...
-0.03*cos(th5)];

x06=-9.5;
y06=-2.5;
phi6=0:0.01:2*pi;

xI1_1=x06+0.6*cos(phi6);
yI1_1=y06+0.9*sin(phi6);

xI1_2=x06+0.55*cos(phi6);
yI1_2=y06+0.85*sin(phi6);

xI1_3=x06+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI1_3=y06+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

x07=1.5;
y07=2.5;
phi7=0:0.01:2*pi;

xI2_1=x07+0.6*cos(phi7);
yI2_1=y07+0.9*sin(phi7);

xI2_2=x07+0.55*cos(phi7);
yI2_2=y07+0.85*sin(phi7);

yI2_3=y07+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
xI2_3=x07+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

```

```

x08=-4.5;
y08=-2.5;

xv1_1=x08+[-1.0,1.0,1.0,-1.0];
yv1_1=y08+[-0.05,-0.05,0.05,0.05]+0.3;

xv1_2=x08+[-0.4,0.4,0.4,-0.4];
yv1_2=y08+[-0.1,-0.1,0.1,0.1]-0.1;

xcable1=[-9.5,-9.5,x01,x01];
ycable1=y01+[0.1,-0.1,-0.1,0.1];

xcable2=[-9.55,-9.45,-9.45,-9.55];
ycable2=[y01+0.1,y01+0.1,y06+0.9,y06+0.9];

xcable3=[-9.55,-9.45,-9.45,-9.55];
ycable3=[-7.0,-7.0,y06-0.9,y06-0.9];

xcable4=[-9.5,-9.5,9.0,9.0];
ycable4=-7.0+[0.1,-0.1,-0.1,0.1];

xcable5=[x04+1.2,x04+1.2,9.0,9.0];
ycable5=y01+[0.1,-0.1,-0.1,0.1];

xcable6=[x04,x04,x07+0.6,x07+0.6];
ycable6=y01+[0.1,-0.1,-0.1,0.1];

xcable7=[x02+1.2,x02+1.2,x07-0.6,x07-0.6];
ycable7=y01+[0.1,-0.1,-0.1,0.1];

xcable8=[x02,x02,x01+1.2,x01+1.2];
ycable8=y01+[0.1,-0.1,-0.1,0.1];

xcable9=x08+[-0.05,0.05,0.05,-0.05];
ycable9=[y01+0.1,y01+0.1,y08+0.35,y08+0.35];

xcable10=x08+[-0.05,0.05,0.05,-0.05];
ycable10=[-7.0,-7.0,y08-0.2,y08-0.2];

xcable11=x05+[-0.05,0.05,0.05,-0.05];
ycable11=[y01+0.1,y01+0.1,y05+1.6,y05+1.6];

xcable12=x05+[-0.05,0.05,0.05,-0.05];
ycable12=[-7.0,-7.0,y05,y05];

xcable13=[x07-2.0,x07-2.0,x03,x03];
ycable13=y03+[0.1,-0.1,-0.1,0.1];

xcable14=[x04+2.0,x04+2.0,x03+1.2,x03+1.2];
ycable14=y03+[0.1,-0.1,-0.1,0.1];

xcable15=x07-2.0+[-0.05,0.05,0.05,-0.05];
ycable15=[y01+0.1,y01+0.1,y03+0.1,y03+0.1];

xcable16=x04+2.0+[-0.05,0.05,0.05,-0.05];
ycable16=[y01+0.1,y01+0.1,y03+0.1,y03+0.1];

xcurr1=x08+[-0.05,0.05,0.05,0.25,0.0,-0.25,-0.05];
ycurr1=y08+2.5+[0.0,0.0,0.9,0.9,1.4,0.9,0.9];

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_11,yres_11,[1.0,1.0,1.0],...
xres_12,yres_12,[0.0,0.0,0.0],...
xres_21,yres_21,[1.0,1.0,1.0],...
xres_22,yres_22,[0.0,0.0,0.0],...
xres_31,yres_31,[1.0,1.0,1.0],...
xres_32,yres_32,[0.0,0.0,0.0],...
xres_41,yres_41,[1.0,1.0,1.0],...
xres_42,yres_42,[0.0,0.0,0.0],...
xres_51,yres_51,[1.0,1.0,1.0],...
xres_52,yres_52,[0.0,0.0,0.0],...
xi1_1,yi1_1,[0.0,0.0,0.0],...
xi1_2,yi1_2,[1.0,1.0,1.0],...
xi1_3,yi1_3,[0.0,0.0,0.0],...
xi2_1,yi2_1,[0.0,0.0,0.0],...
xi2_2,yi2_2,[1.0,1.0,1.0],...
xi2_3,yi2_3,[0.0,0.0,0.0],...

```

```

        xv1_1,yv1_1,[0.0,0.0,0.0],...
        xv1_2,yv1_2,[0.0,0.0,0.0],...
        xcable1,ycable1,[0.8,0.6,0.2],...
        xcable2,ycable2,[0.8,0.6,0.2],...
        xcable3,ycable3,[0.8,0.6,0.2],...
        xcable4,ycable4,[0.8,0.6,0.2],...
        xcable5,ycable5,[0.8,0.6,0.2],...
        xcable6,ycable6,[0.8,0.6,0.2],...
        xcable7,ycable7,[0.8,0.6,0.2],...
        xcable8,ycable8,[0.8,0.6,0.2],...
        xcable9,ycable9,[0.8,0.6,0.2],...
        xcable10,ycable10,[0.8,0.6,0.2],...
        xcable11,ycable11,[0.8,0.6,0.2],...
        xcable12,ycable12,[0.8,0.6,0.2],...
        xcable13,ycable13,[0.8,0.6,0.2],...
        xcable14,ycable14,[0.8,0.6,0.2],...
        xcable15,ycable15,[0.8,0.6,0.2],...
        xcable16,ycable16,[0.8,0.6,0.2],...
        xcurr1,ycurr1,[0.0,0.0,0.0],...
        'LineStyle','None')

text(-11,11,'Βραχυκυκλώνουμε την πηγή τάσης v_{1} και ανοίγουμε την πηγή ρεύματος J_{1}. Βάζουμε στα άκρα a, b
πηγή γνωστής τάσης V_{ab},')
text(-11,10,'που προκαλεί ρεύμα I_{ab}. Θα έχουμε το παρακάτω κύκλωμα')

text(x01+0.5,y01+1.0,'R_1','Color',[0.9,0.2,0.0])
text(x02+0.5,y02+1.0,'R_2','Color',[0.9,0.2,0.0])
text(x03+0.5,y03+1.0,'R_3','Color',[0.9,0.2,0.0])
text(x04+0.5,y04+0.8,'R_4','Color',[0.9,0.2,0.0])
text(x05+0.5,y05+0.8,'R_5','Color',[0.9,0.2,0.0])
text(x06+0.7,y06,'J_1','Color',[0.0,0.4,0.4])
text(x07-0.1,y07-1.7,'I_1','Color',[0.0,0.4,0.4])
text(x08+0.3,y08+3.0,'I_1','Color',[0.0,0.4,0.4])
text(x08+0.5,y08+1.0,'V_1','Color',[0.0,0.2,0.9])
text(9.5,y01,'a','Color',[0.0,0.0,0.0])
text(9.5,-7.0,'b','Color',[0.0,0.0,0.0])

axis([-12,12,-12,12])
axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

% --- Executes on button press in pushbutton2.
function pushbutton2_Callback(hObject, eventdata, handles)
% hObject handle to pushbutton2 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

global R1;
global R2;
global R3;
global R4;
global R5;
global V1;
global J1;

global snmeio;

snmeio=snmeio+1;

if (snmeio==4)
snmeio=1;
end

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

RT=(R4+R5)*(R2-R3)/(R2-R3+R5-R4);
nRT=num2str(0.01*round(100*RT));
I1=(V1-J1*(R2+R3+R4+R5))/(R5+R2-R3-R4);
VT=R4*(J1-I1)+R5*(J1+I1);
nVT=num2str(0.01*round(100*VT));

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

if (snmeio==1)
axes(handles.axes1);
cla

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,9,9];

```

```

x01=-8;
y01=2.5;
th1=0;

xres_11=x01+[0.40*sin(th1),0.40*sin(th1)+1.2*cos(th1),...
-0.40*sin(th1)+1.2*cos(th1),-0.40*sin(th1)];
yres_11=y01+[-0.40*cos(th1),-0.40*cos(th1)+1.2*sin(th1),...
0.40*cos(th1)+1.2*sin(th1),0.40*cos(th1)];

xres_12=x01+[-0.05*sin(th1),-0.05*sin(th1)+0.25*cos(th1),...
-0.40*sin(th1)+0.3*cos(th1),...
0.25*sin(th1)+0.45*cos(th1),...
-0.40*sin(th1)+0.6*cos(th1),...
0.25*sin(th1)+0.75*cos(th1),...
-0.40*sin(th1)+0.9*cos(th1),...
-0.05*sin(th1)+0.95*cos(th1),...
-0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+0.95*cos(th1),...
-0.25*sin(th1)+0.9*cos(th1),...
0.40*sin(th1)+0.75*cos(th1),...
-0.25*sin(th1)+0.6*cos(th1),...
0.40*sin(th1)+0.45*cos(th1),...
-0.25*sin(th1)+0.3*cos(th1),...
0.05*sin(th1)+0.25*cos(th1),...
0.05*sin(th1)];
yres_12=y01+[0.05*cos(th1),0.05*cos(th1)+0.25*sin(th1),...
0.40*cos(th1)+0.3*sin(th1),...
-0.25*cos(th1)+0.45*sin(th1),...
0.40*cos(th1)+0.6*sin(th1),...
-0.250*cos(th1)+0.75*sin(th1),...
0.40*cos(th1)+0.9*sin(th1),...
0.05*cos(th1)+0.95*sin(th1),...
0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+0.95*sin(th1),...
0.25*cos(th1)+0.9*sin(th1),...
-0.40*cos(th1)+0.75*sin(th1),...
0.25*cos(th1)+0.6*sin(th1),...
-0.40*cos(th1)+0.45*sin(th1),...
0.25*cos(th1)+0.3*sin(th1),...
-0.05*cos(th1)+0.25*sin(th1),...
-0.05*cos(th1)];

x02=-3;
y02=2.5;
th2=0;

xres_21=x02+[0.40*sin(th2),0.40*sin(th2)+1.2*cos(th2),...
-0.40*sin(th2)+1.2*cos(th2),-0.40*sin(th2)];
yres_21=y02+[-0.40*cos(th2),-0.40*cos(th2)+1.2*sin(th2),...
0.40*cos(th2)+1.2*sin(th2),0.40*cos(th2)];

xres_22=x02+[-0.05*sin(th2),-0.05*sin(th2)+0.25*cos(th2),...
-0.40*sin(th2)+0.3*cos(th2),...
0.25*sin(th2)+0.45*cos(th2),...
-0.40*sin(th2)+0.6*cos(th2),...
0.25*sin(th2)+0.75*cos(th2),...
-0.40*sin(th2)+0.9*cos(th2),...
-0.05*sin(th2)+0.95*cos(th2),...
-0.05*sin(th2)+1.2*cos(th2),...
0.05*sin(th2)+1.2*cos(th2),...
0.05*sin(th2)+0.95*cos(th2),...
-0.25*sin(th2)+0.9*cos(th2),...
0.40*sin(th2)+0.75*cos(th2),...
-0.25*sin(th2)+0.6*cos(th2),...
0.40*sin(th2)+0.45*cos(th2),...
-0.25*sin(th2)+0.3*cos(th2),...
0.05*sin(th2)+0.25*cos(th2),...
0.05*sin(th2)];
yres_22=y02+[0.05*cos(th2),0.05*cos(th2)+0.25*sin(th2),...
0.40*cos(th2)+0.3*sin(th2),...
-0.25*cos(th2)+0.45*sin(th2),...
0.40*cos(th2)+0.6*sin(th2),...
-0.250*cos(th2)+0.75*sin(th2),...
0.40*cos(th2)+0.9*sin(th2),...
0.05*cos(th2)+0.95*sin(th2),...
0.05*cos(th2)+1.2*sin(th2),...
-0.05*cos(th2)+1.2*sin(th2),...
-0.05*cos(th2)+0.95*sin(th2),...

```

```

0.25*cos(th2)+0.9*sin(th2),...
-0.40*cos(th2)+0.75*sin(th2),...
0.25*cos(th2)+0.6*sin(th2),...
-0.40*cos(th2)+0.45*sin(th2),...
0.25*cos(th2)+0.3*sin(th2),...
-0.05*cos(th2)+0.25*sin(th2),...
-0.05*cos(th2)];

x03=2;
y03=6.5;
th3=0;

xres_31=x03+[0.40*sin(th3),0.40*sin(th3)+1.2*cos(th3),...
-0.40*sin(th3)+1.2*cos(th3),-0.40*sin(th3)];
yres_31=y03+[-0.40*cos(th3),-0.40*cos(th3)+1.2*sin(th3),...
0.40*cos(th3)+1.2*sin(th3),0.40*cos(th3)];

xres_32=x03+[-0.05*sin(th3),-0.05*sin(th3)+0.25*cos(th3),...
-0.40*sin(th3)+0.3*cos(th3),...
0.25*sin(th3)+0.45*cos(th3),...
-0.40*sin(th3)+0.6*cos(th3),...
0.25*sin(th3)+0.75*cos(th3),...
-0.40*sin(th3)+0.9*cos(th3),...
-0.05*sin(th3)+0.95*cos(th3),...
-0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+0.95*cos(th3),...
-0.25*sin(th3)+0.9*cos(th3),...
0.40*sin(th3)+0.75*cos(th3),...
-0.25*sin(th3)+0.6*cos(th3),...
0.40*sin(th3)+0.45*cos(th3),...
-0.25*sin(th3)+0.3*cos(th3),...
0.05*sin(th3)+0.25*cos(th3),...
0.05*sin(th3)];
yres_32=y03+[0.05*cos(th3),0.05*cos(th3)+0.25*sin(th3),...
0.40*cos(th3)+0.3*sin(th3),...
-0.25*cos(th3)+0.45*sin(th3),...
0.40*cos(th3)+0.6*sin(th3),...
-0.250*cos(th3)+0.75*sin(th3),...
0.40*cos(th3)+0.9*sin(th3),...
0.05*cos(th3)+0.95*sin(th3),...
0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+0.95*sin(th3),...
0.25*cos(th3)+0.9*sin(th3),...
-0.40*cos(th3)+0.75*sin(th3),...
0.25*cos(th3)+0.6*sin(th3),...
-0.40*cos(th3)+0.45*sin(th3),...
0.25*cos(th3)+0.3*sin(th3),...
-0.05*cos(th3)+0.25*sin(th3),...
-0.05*cos(th3)];

x04=5;
y04=2.5;
th4=0;

xres_41=x04+[0.40*sin(th4),0.40*sin(th4)+1.2*cos(th4),...
-0.40*sin(th4)+1.2*cos(th4),-0.40*sin(th4)];
yres_41=y04+[-0.40*cos(th4),-0.40*cos(th4)+1.2*sin(th4),...
0.40*cos(th4)+1.2*sin(th4),0.40*cos(th4)];

xres_42=x04+[-0.05*sin(th4),-0.05*sin(th4)+0.25*cos(th4),...
-0.40*sin(th4)+0.3*cos(th4),...
0.25*sin(th4)+0.45*cos(th4),...
-0.40*sin(th4)+0.6*cos(th4),...
0.25*sin(th4)+0.75*cos(th4),...
-0.40*sin(th4)+0.9*cos(th4),...
-0.05*sin(th4)+0.95*cos(th4),...
-0.05*sin(th4)+1.2*cos(th4),...
0.05*sin(th4)+1.2*cos(th4),...
0.05*sin(th4)+0.95*cos(th4),...
-0.25*sin(th4)+0.9*cos(th4),...
0.40*sin(th4)+0.75*cos(th4),...
-0.25*sin(th4)+0.6*cos(th4),...
0.40*sin(th4)+0.45*cos(th4),...
-0.25*sin(th4)+0.3*cos(th4),...
0.05*sin(th4)+0.25*cos(th4),...
0.05*sin(th4)];
yres_42=y04+[0.05*cos(th4),0.05*cos(th4)+0.25*sin(th4),...
0.40*cos(th4)+0.3*sin(th4),...

```

```

-0.25*cos(th4)+0.45*sin(th4),...
0.40*cos(th4)+0.6*sin(th4),...
-0.250*cos(th4)+0.75*sin(th4),...
0.40*cos(th4)+0.9*sin(th4),...
0.05*cos(th4)+0.95*sin(th4),...
0.05*cos(th4)+1.2*sin(th4),...
-0.05*cos(th4)+1.2*sin(th4),...
-0.05*cos(th4)+0.95*sin(th4),...
0.25*cos(th4)+0.9*sin(th4),...
-0.40*cos(th4)+0.75*sin(th4),...
0.25*cos(th4)+0.6*sin(th4),...
-0.40*cos(th4)+0.45*sin(th4),...
0.25*cos(th4)+0.3*sin(th4),...
-0.05*cos(th4)+0.25*sin(th4),...
-0.05*cos(th4)];

x05=3.0;
y05=-3.0;
th5=pi/2;

xres_51=x05+[0.25*sin(th5),0.25*sin(th5)+1.6*cos(th5),...
-0.25*sin(th5)+1.6*cos(th5),-0.25*sin(th5)];
yres_51=y05+[-0.25*cos(th5),-0.25*cos(th5)+1.6*sin(th5),...
0.25*cos(th5)+1.6*sin(th5),0.25*cos(th5)];

xres_52=x05+[-0.03*sin(th5),-0.03*sin(th5)+0.33*cos(th5),...
-0.25*sin(th5)+0.4*cos(th5),...
0.10*sin(th5)+0.6*cos(th5),...
-0.25*sin(th5)+0.8*cos(th5),...
0.10*sin(th5)+1.0*cos(th5),...
-0.25*sin(th5)+1.2*cos(th5),...
-0.03*sin(th5)+1.27*cos(th5),...
-0.03*sin(th5)+1.6*cos(th5),...
0.03*sin(th5)+1.6*cos(th5),...
0.03*sin(th5)+1.27*cos(th5),...
-0.10*sin(th5)+1.2*cos(th5),...
0.25*sin(th5)+1.0*cos(th5),...
-0.10*sin(th5)+0.8*cos(th5),...
0.25*sin(th5)+0.6*cos(th5),...
-0.10*sin(th5)+0.4*cos(th5),...
0.03*sin(th5)+0.33*cos(th5),...
0.03*sin(th5)];
yres_52=y05+[0.03*cos(th5),0.03*cos(th5)+0.33*sin(th5),...
0.25*cos(th5)+0.4*sin(th5),...
-0.10*cos(th5)+0.6*sin(th5),...
0.25*cos(th5)+0.8*sin(th5),...
-0.10*cos(th5)+1.0*sin(th5),...
0.25*cos(th5)+1.2*sin(th5),...
0.03*cos(th5)+1.27*sin(th5),...
0.03*cos(th5)+1.6*sin(th5),...
-0.03*cos(th5)+1.6*sin(th5),...
-0.03*cos(th5)+1.27*sin(th5),...
0.10*cos(th5)+1.2*sin(th5),...
-0.25*cos(th5)+1.0*sin(th5),...
0.10*cos(th5)+0.8*sin(th5),...
-0.25*cos(th5)+0.6*sin(th5),...
0.10*cos(th5)+0.4*sin(th5),...
-0.03*cos(th5)+0.33*sin(th5),...
-0.03*cos(th5)];

x06=-9.5;
y06=-2.5;
phi6=0:0.01:2*pi;

xI1_1=x06+0.6*cos(phi6);
yI1_1=y06+0.9*sin(phi6);

xI1_2=x06+0.55*cos(phi6);
yI1_2=y06+0.85*sin(phi6);

xI1_3=x06+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI1_3=y06+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

x07=1.5;
y07=2.5;
phi7=0:0.01:2*pi;

xI2_1=x07+0.6*cos(phi7);
yI2_1=y07+0.9*sin(phi7);

```

```

xI2_2=x07+0.55*cos(phi7);
yI2_2=y07+0.85*sin(phi7);
yI2_3=y07+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
xI2_3=x07+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

x08=-4.5;
y08=-2.5;

xV1_1=x08+[-1.0,1.0,1.0,-1.0];
yV1_1=y08+[-0.05,-0.05,0.05,0.05]+0.3;

xV1_2=x08+[-0.4,0.4,0.4,-0.4];
yV1_2=y08+[-0.1,-0.1,0.1,0.1]-0.1;

xcable1=[-9.5,-9.5,x01,x01];
ycable1=y01+[0.1,-0.1,-0.1,0.1];

xcable2=[-9.55,-9.45,-9.45,-9.55];
ycable2=[y01+0.1,y01+0.1,y06+0.9,y06+0.9];

xcable3=[-9.55,-9.45,-9.45,-9.55];
ycable3=[-7.0,-7.0,y06-0.9,y06-0.9];

xcable4=[-9.5,-9.5,9.0,9.0];
ycable4=-7.0+[0.1,-0.1,-0.1,0.1];

xcable5=[x04+1.2,x04+1.2,9.0,9.0];
ycable5=y01+[0.1,-0.1,-0.1,0.1];

xcable6=[x04,x04,x07+0.6,x07+0.6];
ycable6=y01+[0.1,-0.1,-0.1,0.1];

xcable7=[x02+1.2,x02+1.2,x07-0.6,x07-0.6];
ycable7=y01+[0.1,-0.1,-0.1,0.1];

xcable8=[x02,x02,x01+1.2,x01+1.2];
ycable8=y01+[0.1,-0.1,-0.1,0.1];

xcable9=x08+[-0.05,0.05,0.05,-0.05];
ycable9=[y01+0.1,y01+0.1,y08+0.35,y08+0.35];

xcable10=x08+[-0.05,0.05,0.05,-0.05];
ycable10=[-7.0,-7.0,y08-0.2,y08-0.2];

xcable11=x05+[-0.05,0.05,0.05,-0.05];
ycable11=[y01+0.1,y01+0.1,y05+1.6,y05+1.6];

xcable12=x05+[-0.05,0.05,0.05,-0.05];
ycable12=[-7.0,-7.0,y05,y05];

xcable13=[x07-2.0,x07-2.0,x03,x03];
ycable13=y03+[0.1,-0.1,-0.1,0.1];

xcable14=[x04+2.0,x04+2.0,x03+1.2,x03+1.2];
ycable14=y03+[0.1,-0.1,-0.1,0.1];

xcable15=x07-2.0+[-0.05,0.05,0.05,-0.05];
ycable15=[y01+0.1,y01+0.1,y03+0.1,y03+0.1];

xcable16=x04+2.0+[-0.05,0.05,0.05,-0.05];
ycable16=[y01+0.1,y01+0.1,y03+0.1,y03+0.1];

xcurr1=x08+[-0.05,0.05,0.05,0.25,0.0,-0.25,-0.05];
ycurr1=y08+2.5+[0.0,0.0,0.9,0.9,1.4,0.9,0.9];

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_11,yres_11,[1.0,1.0,1.0],...
xres_12,yres_12,[0.0,0.0,0.0],...
xres_21,yres_21,[1.0,1.0,1.0],...
xres_22,yres_22,[0.0,0.0,0.0],...
xres_31,yres_31,[1.0,1.0,1.0],...
xres_32,yres_32,[0.0,0.0,0.0],...
xres_41,yres_41,[1.0,1.0,1.0],...
xres_42,yres_42,[0.0,0.0,0.0],...
xres_51,yres_51,[1.0,1.0,1.0],...

```



```

xres_52,yres_52,[0.0,0.0,0.0],...
xI1_1,yI1_1,[0.0,0.0,0.0],...
xI1_2,yI1_2,[1.0,1.0,1.0],...
xI1_3,yI1_3,[0.0,0.0,0.0],...
xI2_1,yI2_1,[0.0,0.0,0.0],...
xI2_2,yI2_2,[1.0,1.0,1.0],...
xI2_3,yI2_3,[0.0,0.0,0.0],...
xV1_1,yV1_1,[0.0,0.0,0.0],...
xV1_2,yV1_2,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
xcable10,ycable10,[0.8,0.6,0.2],...
xcable11,ycable11,[0.8,0.6,0.2],...
xcable12,ycable12,[0.8,0.6,0.2],...
xcable13,ycable13,[0.8,0.6,0.2],...
xcable14,ycable14,[0.8,0.6,0.2],...
xcable15,ycable15,[0.8,0.6,0.2],...
xcable16,ycable16,[0.8,0.6,0.2],...
xcurr1,ycurr1,[0.0,0.0,0.0],...
    'Linestyle','None')

text(-11,11,'Βραχυκυκλώνουμε την πηγή τάσης v_{1} και ανοίγουμε την πηγή ρεύματος J_{1}. Βάζουμε στα άκρα a, b
πηγή γνωστής τάσης V_{ab},')
text(-11,10,'που προκαλεί ρεύμα I_{ab}. Θα έχουμε το παρακάτω κύκλωμα')

text(x01+0.5,y01+1.0,'R_1','Color',[0.9,0.2,0.0])
text(x02+0.5,y02+1.0,'R_2','Color',[0.9,0.2,0.0])
text(x03+0.5,y03+1.0,'R_3','Color',[0.9,0.2,0.0])
text(x04+0.5,y04+0.8,'R_4','Color',[0.9,0.2,0.0])
text(x05+0.5,y05+0.8,'R_5','Color',[0.9,0.2,0.0])
text(x06+0.7,y06,'J_1','Color',[0.0,0.4,0.4])
text(x07-0.1,y07-1.7,'I_1','Color',[0.0,0.4,0.4])
text(x08+0.3,y08+3.0,'I_1','Color',[0.0,0.4,0.4])
text(x08+0.5,y08+1.0,'V_1','Color',[0.0,0.2,0.9])
text(9.5,y01,'a','Color',[0.0,0.0,0.0])
text(9.5,-7.0,'b','Color',[0.0,0.0,0.0])

axis([-12,12,-12,12])
axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
elseif (snmeio==2)
axes(handles.axes1);
cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,9,9];

x01=-8;
y01=2.5;
th1=0;

x02=-3;
y02=2.5;
th2=0;

xres_21=x02+[0.40*sin(th2),0.40*sin(th2)+1.2*cos(th2),...
-0.40*sin(th2)+1.2*cos(th2),-0.40*sin(th2)];
yres_21=y02+[-0.40*cos(th2),-0.40*cos(th2)+1.2*sin(th2),...
0.40*cos(th2)+1.2*sin(th2),0.40*cos(th2)];

xres_22=x02+[-0.05*sin(th2),-0.05*sin(th2)+0.25*cos(th2),...
-0.40*sin(th2)+0.3*cos(th2),...
0.25*sin(th2)+0.45*cos(th2),...
-0.40*sin(th2)+0.6*cos(th2),...
0.25*sin(th2)+0.75*cos(th2),...
-0.40*sin(th2)+0.9*cos(th2),...
-0.05*sin(th2)+0.95*cos(th2),...
-0.05*sin(th2)+1.2*cos(th2),...
0.05*sin(th2)+1.2*cos(th2),...
0.05*sin(th2)+0.95*cos(th2),...

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-0.25*sin(th2)+0.9*cos(th2),...
0.40*sin(th2)+0.75*cos(th2),...
-0.25*sin(th2)+0.6*cos(th2),...
0.40*sin(th2)+0.45*cos(th2),...
-0.25*sin(th2)+0.3*cos(th2),...
0.05*sin(th2)+0.25*cos(th2),...
0.05*sin(th2)];
yres_22=y02+[0.05*cos(th2),0.05*cos(th2)+0.25*sin(th2),...
0.40*cos(th2)+0.3*sin(th2),...
-0.25*cos(th2)+0.45*sin(th2),...
0.40*cos(th2)+0.6*sin(th2),...
-0.250*cos(th2)+0.75*sin(th2),...
0.40*cos(th2)+0.9*sin(th2),...
0.05*cos(th2)+0.95*sin(th2),...
0.05*cos(th2)+1.2*sin(th2),...
-0.05*cos(th2)+1.2*sin(th2),...
-0.05*cos(th2)+0.95*sin(th2),...
0.25*cos(th2)+0.9*sin(th2),...
-0.40*cos(th2)+0.75*sin(th2),...
0.25*cos(th2)+0.6*sin(th2),...
-0.40*cos(th2)+0.45*sin(th2),...
0.25*cos(th2)+0.3*sin(th2),...
-0.05*cos(th2)+0.25*sin(th2),...
-0.05*cos(th2)];

x03=2;
y03=6.5;
th3=0;

xres_31=x03+[0.40*sin(th3),0.40*sin(th3)+1.2*cos(th3),...
-0.40*sin(th3)+1.2*cos(th3),-0.40*sin(th3)];
yres_31=y03+[-0.40*cos(th3),-0.40*cos(th3)+1.2*sin(th3),...
0.40*cos(th3)+1.2*sin(th3),0.40*cos(th3)];

xres_32=x03+[-0.05*sin(th3),-0.05*sin(th3)+0.25*cos(th3),...
-0.40*sin(th3)+0.3*cos(th3),...
0.25*sin(th3)+0.45*cos(th3),...
-0.40*sin(th3)+0.6*cos(th3),...
0.25*sin(th3)+0.75*cos(th3),...
-0.40*sin(th3)+0.9*cos(th3),...
-0.05*sin(th3)+0.95*cos(th3),...
-0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+0.95*cos(th3),...
-0.25*sin(th3)+0.9*cos(th3),...
0.40*sin(th3)+0.75*cos(th3),...
-0.25*sin(th3)+0.6*cos(th3),...
0.40*sin(th3)+0.45*cos(th3),...
-0.25*sin(th3)+0.3*cos(th3),...
0.05*sin(th3)+0.25*cos(th3),...
0.05*sin(th3)];
yres_32=y03+[0.05*cos(th3),0.05*cos(th3)+0.25*sin(th3),...
0.40*cos(th3)+0.3*sin(th3),...
-0.25*cos(th3)+0.45*sin(th3),...
0.40*cos(th3)+0.6*sin(th3),...
-0.250*cos(th3)+0.75*sin(th3),...
0.40*cos(th3)+0.9*sin(th3),...
0.05*cos(th3)+0.95*sin(th3),...
0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+0.95*sin(th3),...
0.25*cos(th3)+0.9*sin(th3),...
-0.40*cos(th3)+0.75*sin(th3),...
0.25*cos(th3)+0.6*sin(th3),...
-0.40*cos(th3)+0.45*sin(th3),...
0.25*cos(th3)+0.3*sin(th3),...
-0.05*cos(th3)+0.25*sin(th3),...
-0.05*cos(th3)];

x04=5;
y04=2.5;
th4=0;

xres_41=x04+[0.40*sin(th4),0.40*sin(th4)+1.2*cos(th4),...
-0.40*sin(th4)+1.2*cos(th4),-0.40*sin(th4)];
yres_41=y04+[-0.40*cos(th4),-0.40*cos(th4)+1.2*sin(th4),...
0.40*cos(th4)+1.2*sin(th4),0.40*cos(th4)];

xres_42=x04+[-0.05*sin(th4),-0.05*sin(th4)+0.25*cos(th4),...
-0.40*sin(th4)+0.3*cos(th4),...

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0.25*sin(th4)+0.45*cos(th4),...
-0.40*sin(th4)+0.6*cos(th4),...
0.25*sin(th4)+0.75*cos(th4),...
-0.40*sin(th4)+0.9*cos(th4),...
-0.05*sin(th4)+0.95*cos(th4),...
-0.05*sin(th4)+1.2*cos(th4),...
0.05*sin(th4)+1.2*cos(th4),...
0.05*sin(th4)+0.95*cos(th4),...
-0.25*sin(th4)+0.9*cos(th4),...
0.40*sin(th4)+0.75*cos(th4),...
-0.25*sin(th4)+0.6*cos(th4),...
0.40*sin(th4)+0.45*cos(th4),...
-0.25*sin(th4)+0.3*cos(th4),...
0.05*sin(th4)+0.25*cos(th4),...
0.05*sin(th4)];
yres_42=y04+[0.05*cos(th4),0.05*cos(th4)+0.25*sin(th4),...
0.40*cos(th4)+0.3*sin(th4),...
-0.25*cos(th4)+0.45*sin(th4),...
0.40*cos(th4)+0.6*sin(th4),...
-0.250*cos(th4)+0.75*sin(th4),...
0.40*cos(th4)+0.9*sin(th4),...
0.05*cos(th4)+0.95*sin(th4),...
0.05*cos(th4)+1.2*sin(th4),...
-0.05*cos(th4)+1.2*sin(th4),...
-0.05*cos(th4)+0.95*sin(th4),...
0.25*cos(th4)+0.9*sin(th4),...
-0.40*cos(th4)+0.75*sin(th4),...
0.25*cos(th4)+0.6*sin(th4),...
-0.40*cos(th4)+0.45*sin(th4),...
0.25*cos(th4)+0.3*sin(th4),...
-0.05*cos(th4)+0.25*sin(th4),...
-0.05*cos(th4)];
x05=3.0;
y05=-3.0;
th5=pi/2;
xres_51=x05+[0.25*sin(th5),0.25*sin(th5)+1.6*cos(th5),...
-0.25*sin(th5)+1.6*cos(th5),-0.25*sin(th5)];
yres_51=y05+[-0.25*cos(th5),-0.25*cos(th5)+1.6*sin(th5),...
0.25*cos(th5)+1.6*sin(th5),0.25*cos(th5)];
xres_52=x05+[-0.03*sin(th5),-0.03*sin(th5)+0.33*cos(th5),...
-0.25*sin(th5)+0.4*cos(th5),...
0.10*sin(th5)+0.6*cos(th5),...
-0.25*sin(th5)+0.8*cos(th5),...
0.10*sin(th5)+1.0*cos(th5),...
-0.25*sin(th5)+1.2*cos(th5),...
-0.03*sin(th5)+1.27*cos(th5),...
-0.03*sin(th5)+1.6*cos(th5),...
0.03*sin(th5)+1.6*cos(th5),...
0.03*sin(th5)+1.27*cos(th5),...
-0.10*sin(th5)+1.2*cos(th5),...
0.25*sin(th5)+1.0*cos(th5),...
-0.10*sin(th5)+0.8*cos(th5),...
0.25*sin(th5)+0.6*cos(th5),...
-0.10*sin(th5)+0.4*cos(th5),...
0.03*sin(th5)+0.33*cos(th5),...
0.03*sin(th5)];
yres_52=y05+[0.03*cos(th5),0.03*cos(th5)+0.33*sin(th5),...
0.25*cos(th5)+0.4*sin(th5),...
-0.10*cos(th5)+0.6*sin(th5),...
0.25*cos(th5)+0.8*sin(th5),...
-0.10*cos(th5)+1.0*sin(th5),...
0.25*cos(th5)+1.2*sin(th5),...
0.03*cos(th5)+1.27*sin(th5),...
0.03*cos(th5)+1.6*sin(th5),...
-0.03*cos(th5)+1.6*sin(th5),...
-0.03*cos(th5)+1.27*sin(th5),...
0.10*cos(th5)+1.2*sin(th5),...
-0.25*cos(th5)+1.0*sin(th5),...
0.10*cos(th5)+0.8*sin(th5),...
-0.25*cos(th5)+0.6*sin(th5),...
0.10*cos(th5)+0.4*sin(th5),...
-0.03*cos(th5)+0.33*sin(th5),...
-0.03*cos(th5)];
x06=-9.5;
y06=-2.5;
phi6=0:0.01:2*pi;

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```

x07=1.5;
y07=2.5;
phi7=0:0.01:2*pi;

xI2_1=x07+0.6*cos(phi7);
yI2_1=y07+0.9*sin(phi7);

xI2_2=x07+0.55*cos(phi7);
yI2_2=y07+0.85*sin(phi7);

yI2_3=y07+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
xI2_3=x07+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

x08=-4.5;
y08=-2.5;

x09=9.0;
y09=-2.5;

xv1_1=x09+[-1.0,1.0,1.0,-1.0];
yv1_1=y09+[-0.05,-0.05,0.05,0.05]+0.3;

xv1_2=x09+[-0.4,0.4,0.4,-0.4];
yv1_2=y09+[-0.1,-0.1,0.1,0.1]-0.1;

xcable4=[x08,x08,9.0,9.0];
ycable4=-7.0+[0.1,-0.1,-0.1,0.1];

xcable5=[x04+1.2,x04+1.2,9.0,9.0];
ycable5=y01+[0.1,-0.1,-0.1,0.1];

xcable6=[x04,x04,x07+0.6,x07+0.6];
ycable6=y01+[0.1,-0.1,-0.1,0.1];

xcable7=[x02+1.2,x02+1.2,x07-0.6,x07-0.6];
ycable7=y01+[0.1,-0.1,-0.1,0.1];

xcable8=[x02,x02,x08,x08];
ycable8=y01+[0.1,-0.1,-0.1,0.1];

xcable9=x08+[-0.05,0.05,0.05,-0.05];
ycable9=[y01+0.1,y01+0.1,y08+0.35,y08+0.35];

xcable10=x08+[-0.05,0.05,0.05,-0.05];
ycable10=[-7.0,-7.0,y08+0.35,y08+0.35];

xcable11=x05+[-0.05,0.05,0.05,-0.05];
ycable11=[y01+0.1,y01+0.1,y05+1.6,y05+1.6];

xcable12=x05+[-0.05,0.05,0.05,-0.05];
ycable12=[-7.0,-7.0,y05,y05];

xcable13=[x07-2.0,x07-2.0,x03,x03];
ycable13=y03+[0.1,-0.1,-0.1,0.1];

xcable14=[x04+3.0,x04+3.0,x03+1.2,x03+1.2];
ycable14=y03+[0.1,-0.1,-0.1,0.1];

xcable15=x07-2.0+[-0.05,0.05,0.05,-0.05];
ycable15=[y01+0.1,y01+0.1,y03+0.1,y03+0.1];

xcable16=x04+3.0+[-0.05,0.05,0.05,-0.05];
ycable16=[y01+0.1,y01+0.1,y03+0.1,y03+0.1];

xcable17=9.0+[-0.05,0.05,0.05,-0.05];
ycable17=[y01+0.1,y01+0.1,y09+0.35,y09+0.35];

xcable18=9.0+[-0.05,0.05,0.05,-0.05];
ycable18=[-7.0,-7.0,y09-0.2,y09-0.2];

xcurr1=x08+[-0.05,0.05,0.05,0.25,0.0,-0.25,-0.05];
ycurr1=y08+2.5+[0.0,0.0,0.9,0.9,1.4,0.9,0.9];

xcurrab=x09+[-0.05,0.05,0.05,0.25,0.0,-0.25,-0.05];

```

```

ycurrab=y09+2.5+[0.0,0.0,0.9,0.9,1.4,0.9,0.9];
xcurr3=x05+[-0.05,0.05,0.05,0.25,0.0,-0.25,-0.05];
ycurr3=y05+4.5+[0.0,0.0,-0.9,-0.9,-1.4,-0.9,-0.9];

xcurrj1=6.5+[0.0,-0.7,-0.7,-1.2,-0.7,-0.7,0.0];
ycurrj1=y03+[0.1,0.1,0.3,0.0,-0.3,-0.1,-0.1];

xcurr2=8.0+[0.0,-0.7,-0.7,-1.2,-0.7,-0.7,0.0];
ycurr2=y04+[0.1,0.1,0.3,0.0,-0.3,-0.1,-0.1];

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_21,yres_21,[1.0,1.0,1.0],...
xres_22,yres_22,[0.0,0.0,0.0],...
xres_31,yres_31,[1.0,1.0,1.0],...
xres_32,yres_32,[0.0,0.0,0.0],...
xres_41,yres_41,[1.0,1.0,1.0],...
xres_42,yres_42,[0.0,0.0,0.0],...
xres_51,yres_51,[1.0,1.0,1.0],...
xres_52,yres_52,[0.0,0.0,0.0],...
xI2_1,yI2_1,[0.0,0.0,0.0],...
xI2_2,yI2_2,[1.0,1.0,1.0],...
xI2_3,yI2_3,[0.0,0.0,0.0],...
xV1_1,yV1_1,[0.0,0.0,0.0],...
xV1_2,yV1_2,[0.0,0.0,0.0],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
xcable10,ycable10,[0.8,0.6,0.2],...
xcable11,ycable11,[0.8,0.6,0.2],...
xcable12,ycable12,[0.8,0.6,0.2],...
xcable13,ycable13,[0.8,0.6,0.2],...
xcable14,ycable14,[0.8,0.6,0.2],...
xcable15,ycable15,[0.8,0.6,0.2],...
xcable16,ycable16,[0.8,0.6,0.2],...
xcable17,ycable17,[0.8,0.6,0.2],...
xcable18,ycable18,[0.8,0.6,0.2],...
xcurr1,ycurr1,[0.0,0.0,0.0],...
xcurr2,ycurr2,[0.0,0.0,0.0],...
ycurrab,ycurrab,[0.0,0.0,0.0],...
xcurr3,ycurr3,[0.0,0.0,0.0],...
xcurrj1,ycurrj1,[0.0,0.0,0.0],...
'Linestyle','None')

text(-11,11,'Ισχύουν οι σχέσεις  $I_{(2)}=I_{(ab)}-I_{(1)}$ ,  $I_{(3)}=2I_{(1)}+I_{(2)}=I_{(ab)}+I_{(1)}$ ,
 $V_{(ab)}=R_{(4)}I_{(2)}+R_{(5)}I_{(3)}$ , και  $V_{(ab)}=R_{(3)}I_{(1)}-R_{(2)}I_{(1)}$ . Από αυτές με πράξεις προκύπτει')
text(-11,10,' $V_{(ab)}(1+(R_{(5)}-R_{(4)})/(R_{(2)}-R_{(3)}))=(R_{(4)}+R_{(5)})I_{(ab)}$ , οπότε για την αντίσταση Thevenin θα
έχουμε')
text(4,10,' $R_{(T)}=V_{(ab)}/I_{(ab)}='$ )
text(6.5,10.2,nRT)
text(7.3,10.2,'Ohm.')

text(x02+0.5,y02+1.0,'R_2','Color',[0.9,0.2,0.0])
text(x03+0.5,y03+1.0,'R_3','Color',[0.9,0.2,0.0])
text(x04+0.5,y04+0.8,'R_4','Color',[0.9,0.2,0.0])
text(x05+0.5,y05+0.8,'R_5','Color',[0.9,0.2,0.0])
text(x07-0.1,y07-1.7,'2I_1','Color',[0.0,0.4,0.4])
text(x08+0.3,y08+3.0,'I_1','Color',[0.0,0.4,0.4])
text(x05+0.3,y05+4.0,'I_3','Color',[0.0,0.4,0.4])
text(x09+0.3,y05+3.5,'I_{ab}','Color',[0.0,0.4,0.4])
text(6.0,y03+0.8,'I_1','Color',[0.0,0.4,0.4])
text(7.5,y04+0.8,'I_2','Color',[0.0,0.4,0.4])
text(x09+0.5,y09+1.0,'V_{ab}','Color',[0.0,0.2,0.9])
text(8.5,y01+0.5,'a','Color',[0.0,0.0,0.0])
text(8.5,-7.5,'b','Color',[0.0,0.0,0.0])

axis([-12,12,-12,12])
axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
elseif (snmeio==3)
axes(handles.axes1);
cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=-12,12,12,-12];
y_back=-12,-12,12,12];

```

```

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,9,9];

x01=-8;
y01=2.5;
th1=0;

xres_11=x01+[0.40*sin(th1),0.40*sin(th1)+1.2*cos(th1),...
-0.40*sin(th1)+1.2*cos(th1),-0.40*sin(th1)];
yres_11=y01+[-0.40*cos(th1),-0.40*cos(th1)+1.2*sin(th1),...
0.40*cos(th1)+1.2*sin(th1),0.40*cos(th1)];

xres_12=x01+[-0.05*sin(th1),-0.05*sin(th1)+0.25*cos(th1),...
-0.40*sin(th1)+0.3*cos(th1),...
0.25*sin(th1)+0.45*cos(th1),...
-0.40*sin(th1)+0.6*cos(th1),...
0.25*sin(th1)+0.75*cos(th1),...
-0.40*sin(th1)+0.9*cos(th1),...
-0.05*sin(th1)+0.95*cos(th1),...
-0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+0.95*cos(th1),...
-0.25*sin(th1)+0.9*cos(th1),...
0.40*sin(th1)+0.75*cos(th1),...
-0.25*sin(th1)+0.6*cos(th1),...
0.40*sin(th1)+0.45*cos(th1),...
-0.25*sin(th1)+0.3*cos(th1),...
0.05*sin(th1)+0.25*cos(th1),...
0.05*sin(th1)];
yres_12=y01+[0.05*cos(th1),0.05*cos(th1)+0.25*sin(th1),...
0.40*cos(th1)+0.3*sin(th1),...
-0.25*cos(th1)+0.45*sin(th1),...
0.40*cos(th1)+0.6*sin(th1),...
-0.250*cos(th1)+0.75*sin(th1),...
0.40*cos(th1)+0.9*sin(th1),...
0.05*cos(th1)+0.95*sin(th1),...
0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+0.95*sin(th1),...
0.25*cos(th1)+0.9*sin(th1),...
-0.40*cos(th1)+0.75*sin(th1),...
0.25*cos(th1)+0.6*sin(th1),...
-0.40*cos(th1)+0.45*sin(th1),...
0.25*cos(th1)+0.3*sin(th1),...
-0.05*cos(th1)+0.25*sin(th1),...
-0.05*cos(th1)];

x02=-3;
y02=2.5;
th2=0;

xres_21=x02+[0.40*sin(th2),0.40*sin(th2)+1.2*cos(th2),...
-0.40*sin(th2)+1.2*cos(th2),-0.40*sin(th2)];
yres_21=y02+[-0.40*cos(th2),-0.40*cos(th2)+1.2*sin(th2),...
0.40*cos(th2)+1.2*sin(th2),0.40*cos(th2)];

xres_22=x02+[-0.05*sin(th2),-0.05*sin(th2)+0.25*cos(th2),...
-0.40*sin(th2)+0.3*cos(th2),...
0.25*sin(th2)+0.45*cos(th2),...
-0.40*sin(th2)+0.6*cos(th2),...
0.25*sin(th2)+0.75*cos(th2),...
-0.40*sin(th2)+0.9*cos(th2),...
-0.05*sin(th2)+0.95*cos(th2),...
-0.05*sin(th2)+1.2*cos(th2),...
0.05*sin(th2)+1.2*cos(th2),...
0.05*sin(th2)+0.95*cos(th2),...
-0.25*sin(th2)+0.9*cos(th2),...
0.40*sin(th2)+0.75*cos(th2),...
-0.25*sin(th2)+0.6*cos(th2),...
0.40*sin(th2)+0.45*cos(th2),...
-0.25*sin(th2)+0.3*cos(th2),...
0.05*sin(th2)+0.25*cos(th2),...
0.05*sin(th2)];
yres_22=y02+[0.05*cos(th2),0.05*cos(th2)+0.25*sin(th2),...
0.40*cos(th2)+0.3*sin(th2),...
-0.25*cos(th2)+0.45*sin(th2),...
0.40*cos(th2)+0.6*sin(th2),...
-0.250*cos(th2)+0.75*sin(th2),...
0.40*cos(th2)+0.9*sin(th2),...
0.05*cos(th2)+0.95*sin(th2),...

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```

0.05*cos(th2)+1.2*sin(th2),...
-0.05*cos(th2)+1.2*sin(th2),...
-0.05*cos(th2)+0.95*sin(th2),...
0.25*cos(th2)+0.9*sin(th2),...
-0.40*cos(th2)+0.75*sin(th2),...
0.25*cos(th2)+0.6*sin(th2),...
-0.40*cos(th2)+0.45*sin(th2),...
0.25*cos(th2)+0.3*sin(th2),...
-0.05*cos(th2)+0.25*sin(th2),...
-0.05*cos(th2)];

x03=2;
y03=6.5;
th3=0;

xres_31=x03+[0.40*sin(th3),0.40*sin(th3)+1.2*cos(th3),...
-0.40*sin(th3)+1.2*cos(th3),-0.40*sin(th3)];
yres_31=y03+[-0.40*cos(th3),-0.40*cos(th3)+1.2*sin(th3),...
0.40*cos(th3)+1.2*sin(th3),0.40*cos(th3)];

xres_32=x03+[-0.05*sin(th3),-0.05*sin(th3)+0.25*cos(th3),...
-0.40*sin(th3)+0.3*cos(th3),...
0.25*sin(th3)+0.45*cos(th3),...
-0.40*sin(th3)+0.6*cos(th3),...
0.25*sin(th3)+0.75*cos(th3),...
-0.40*sin(th3)+0.9*cos(th3),...
-0.05*sin(th3)+0.95*cos(th3),...
-0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+0.95*cos(th3),...
-0.25*sin(th3)+0.9*cos(th3),...
0.40*sin(th3)+0.75*cos(th3),...
-0.25*sin(th3)+0.6*cos(th3),...
0.40*sin(th3)+0.45*cos(th3),...
-0.25*sin(th3)+0.3*cos(th3),...
0.05*sin(th3)+0.25*cos(th3),...
0.05*sin(th3)];
yres_32=y03+[0.05*cos(th3),0.05*cos(th3)+0.25*sin(th3),...
0.40*cos(th3)+0.3*sin(th3),...
-0.25*cos(th3)+0.45*sin(th3),...
0.40*cos(th3)+0.6*sin(th3),...
-0.25*cos(th3)+0.75*sin(th3),...
0.40*cos(th3)+0.9*sin(th3),...
0.05*cos(th3)+0.95*sin(th3),...
0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+0.95*sin(th3),...
0.25*cos(th3)+0.9*sin(th3),...
-0.40*cos(th3)+0.75*sin(th3),...
0.25*cos(th3)+0.6*sin(th3),...
-0.40*cos(th3)+0.45*sin(th3),...
0.25*cos(th3)+0.3*sin(th3),...
-0.05*cos(th3)+0.25*sin(th3),...
-0.05*cos(th3)];

x04=5;
y04=2.5;
th4=0;

xres_41=x04+[0.40*sin(th4),0.40*sin(th4)+1.2*cos(th4),...
-0.40*sin(th4)+1.2*cos(th4),-0.40*sin(th4)];
yres_41=y04+[-0.40*cos(th4),-0.40*cos(th4)+1.2*sin(th4),...
0.40*cos(th4)+1.2*sin(th4),0.40*cos(th4)];

xres_42=x04+[-0.05*sin(th4),-0.05*sin(th4)+0.25*cos(th4),...
-0.40*sin(th4)+0.3*cos(th4),...
0.25*sin(th4)+0.45*cos(th4),...
-0.40*sin(th4)+0.6*cos(th4),...
0.25*sin(th4)+0.75*cos(th4),...
-0.40*sin(th4)+0.9*cos(th4),...
-0.05*sin(th4)+0.95*cos(th4),...
-0.05*sin(th4)+1.2*cos(th4),...
0.05*sin(th4)+1.2*cos(th4),...
0.05*sin(th4)+0.95*cos(th4),...
-0.25*sin(th4)+0.9*cos(th4),...
0.40*sin(th4)+0.75*cos(th4),...
-0.25*sin(th4)+0.6*cos(th4),...
0.40*sin(th4)+0.45*cos(th4),...
-0.25*sin(th4)+0.3*cos(th4),...
0.05*sin(th4)+0.25*cos(th4),...
0.05*sin(th4)];

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```

        0.05*sin(th4)];
yres_42=y04+[0.05*cos(th4),0.05*cos(th4)+0.25*sin(th4),...
0.40*cos(th4)+0.3*sin(th4),...
-0.25*cos(th4)+0.45*sin(th4),...
0.40*cos(th4)+0.6*sin(th4),...
-0.250*cos(th4)+0.75*sin(th4),...
0.40*cos(th4)+0.9*sin(th4),...
0.05*cos(th4)+0.95*sin(th4),...
0.05*cos(th4)+1.2*sin(th4),...
-0.05*cos(th4)+1.2*sin(th4),...
-0.05*cos(th4)+0.95*sin(th4),...
0.25*cos(th4)+0.9*sin(th4),...
-0.40*cos(th4)+0.75*sin(th4),...
0.25*cos(th4)+0.6*sin(th4),...
-0.40*cos(th4)+0.45*sin(th4),...
0.25*cos(th4)+0.3*sin(th4),...
-0.05*cos(th4)+0.25*sin(th4),...
-0.05*cos(th4)];

        x05=3.0;
        y05=-3.0;
        th5=pi/2;

xres_51=x05+[0.25*sin(th5),0.25*sin(th5)+1.6*cos(th5),...
-0.25*sin(th5)+1.6*cos(th5),-0.25*sin(th5)];
yres_51=y05+[-0.25*cos(th5),-0.25*cos(th5)+1.6*sin(th5),...
0.25*cos(th5)+1.6*sin(th5),0.25*cos(th5)];

xres_52=x05+[-0.03*sin(th5),-0.03*sin(th5)+0.33*cos(th5),...
-0.25*sin(th5)+0.4*cos(th5),...
0.10*sin(th5)+0.6*cos(th5),...
-0.25*sin(th5)+0.8*cos(th5),...
0.10*sin(th5)+1.0*cos(th5),...
-0.25*sin(th5)+1.2*cos(th5),...
-0.03*sin(th5)+1.27*cos(th5),...
-0.03*sin(th5)+1.6*cos(th5),...
0.03*sin(th5)+1.6*cos(th5),...
0.03*sin(th5)+1.27*cos(th5),...
-0.10*sin(th5)+1.2*cos(th5),...
0.25*sin(th5)+1.0*cos(th5),...
-0.10*sin(th5)+0.8*cos(th5),...
0.25*sin(th5)+0.6*cos(th5),...
-0.10*sin(th5)+0.4*cos(th5),...
0.03*sin(th5)+0.33*cos(th5),...
0.03*sin(th5)];
yres_52=y05+[0.03*cos(th5),0.03*cos(th5)+0.33*sin(th5),...
0.25*cos(th5)+0.4*sin(th5),...
-0.10*cos(th5)+0.6*sin(th5),...
0.25*cos(th5)+0.8*sin(th5),...
-0.10*cos(th5)+1.0*sin(th5),...
0.25*cos(th5)+1.2*sin(th5),...
0.03*cos(th5)+1.27*sin(th5),...
0.03*cos(th5)+1.6*sin(th5),...
-0.03*cos(th5)+1.6*sin(th5),...
-0.03*cos(th5)+1.27*sin(th5),...
0.10*cos(th5)+1.2*sin(th5),...
-0.25*cos(th5)+1.0*sin(th5),...
0.10*cos(th5)+0.8*sin(th5),...
-0.25*cos(th5)+0.6*sin(th5),...
0.10*cos(th5)+0.4*sin(th5),...
-0.03*cos(th5)+0.33*sin(th5),...
-0.03*cos(th5)];

        x06=-9.5;
        y06=-2.5;
        phi6=0:0.01:2*pi;

        xI1_1=x06+0.6*cos(phi6);
        yI1_1=y06+0.9*sin(phi6);

        xI1_2=x06+0.55*cos(phi6);
        yI1_2=y06+0.85*sin(phi6);

xI1_3=x06+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI1_3=y06+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

        x07=1.5;
        y07=2.5;
        phi7=0:0.01:2*pi;

```



```

xI2_1=x07+0.6*cos(phi7);
yI2_1=y07+0.9*sin(phi7);

xI2_2=x07+0.55*cos(phi7);
yI2_2=y07+0.85*sin(phi7);

yI2_3=y07+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
xI2_3=x07+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

x08=-4.5;
y08=-2.5;

xV1_1=x08+[-1.0,1.0,1.0,-1.0];
yV1_1=y08+[-0.05,-0.05,0.05,0.05]+0.3;

xV1_2=x08+[-0.4,0.4,0.4,-0.4];
yV1_2=y08+[-0.1,-0.1,0.1,0.1]-0.1;

xcable1=[-9.5,-9.5,x01,x01];
ycable1=y01+[0.1,-0.1,-0.1,0.1];

xcable2=[-9.55,-9.45,-9.45,-9.55];
ycable2=[y01+0.1,y01+0.1,y06+0.9,y06+0.9];

xcable3=[-9.55,-9.45,-9.45,-9.55];
ycable3=[-7.0,-7.0,y06-0.9,y06-0.9];

xcable4=[-9.5,-9.5,9.0,9.0];
ycable4=-7.0+[0.1,-0.1,-0.1,0.1];

xcable5=[x04+1.2,x04+1.2,9.0,9.0];
ycable5=y01+[0.1,-0.1,-0.1,0.1];

xcable6=[x04,x04,x07+0.6,x07+0.6];
ycable6=y01+[0.1,-0.1,-0.1,0.1];

xcable7=[x02+1.2,x02+1.2,x07-0.6,x07-0.6];
ycable7=y01+[0.1,-0.1,-0.1,0.1];

xcable8=[x02,x02,x01+1.2,x01+1.2];
ycable8=y01+[0.1,-0.1,-0.1,0.1];

xcable9=x08+[-0.05,0.05,0.05,-0.05];
ycable9=[y01+0.1,y01+0.1,y08+0.35,y08+0.35];

xcable10=x08+[-0.05,0.05,0.05,-0.05];
ycable10=[-7.0,-7.0,y08-0.2,y08-0.2];

xcable11=x05+[-0.05,0.05,0.05,-0.05];
ycable11=[y01+0.1,y01+0.1,y05+1.6,y05+1.6];

xcable12=x05+[-0.05,0.05,0.05,-0.05];
ycable12=[-7.0,-7.0,y05,y05];

xcable13=[x07-2.0,x07-2.0,x03,x03];
ycable13=y03+[0.1,-0.1,-0.1,0.1];

xcable14=[x04+2.0,x04+2.0,x03+1.2,x03+1.2];
ycable14=y03+[0.1,-0.1,-0.1,0.1];

xcable15=x07-2.0+[-0.05,0.05,0.05,-0.05];
ycable15=[y01+0.1,y01+0.1,y03+0.1,y03+0.1];

xcable16=x04+2.0+[-0.05,0.05,0.05,-0.05];
ycable16=[y01+0.1,y01+0.1,y03+0.1,y03+0.1];

xcurr1=x08+[-0.05,0.05,0.05,0.25,0.0,-0.25,-0.05];
ycurr1=y08+2.5+[0.0,0.0,0.9,0.9,1.4,0.9,0.9];

xcurr1j1=x05+[-0.05,0.05,0.05,0.25,0.0,-0.25,-0.05];
ycurr1j1=y05+4.5+[0.0,0.0,-0.9,-0.9,-1.4,-0.9,-0.9];

xcurr2=x02+1.3+[0.0,0.0,0.7,0.7,1.2,0.7,0.7];
ycurr2=y02+[0.1,-0.1,-0.1,-0.25,0.0,0.25,0.1];

xcurr3=x03+1.9+[0.0,0.0,0.7,0.7,1.2,0.7,0.7];
ycurr3=y03+[0.1,-0.1,-0.1,-0.25,0.0,0.25,0.1];

xcurr4=x04-1.5+[0.0,0.0,0.7,0.7,1.2,0.7,0.7];

```

```
ycurr4=y02+[0.1,-0.1,-0.1,-0.25,0.0,0.25,0.1];
```

```
fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_11,yres_11,[1.0,1.0,1.0],...
xres_12,yres_12,[0.0,0.0,0.0],...
xres_21,yres_21,[1.0,1.0,1.0],...
xres_22,yres_22,[0.0,0.0,0.0],...
xres_31,yres_31,[1.0,1.0,1.0],...
xres_32,yres_32,[0.0,0.0,0.0],...
xres_41,yres_41,[1.0,1.0,1.0],...
xres_42,yres_42,[0.0,0.0,0.0],...
xres_51,yres_51,[1.0,1.0,1.0],...
xres_52,yres_52,[0.0,0.0,0.0],...
xi1_1,yi1_1,[0.0,0.0,0.0],...
xi1_2,yi1_2,[1.0,1.0,1.0],...
xi1_3,yi1_3,[0.0,0.0,0.0],...
xi2_1,yi2_1,[0.0,0.0,0.0],...
xi2_2,yi2_2,[1.0,1.0,1.0],...
xi2_3,yi2_3,[0.0,0.0,0.0],...
xv1_1,yv1_1,[0.0,0.0,0.0],...
xv1_2,yv1_2,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
xcable10,ycable10,[0.8,0.6,0.2],...
xcable11,ycable11,[0.8,0.6,0.2],...
xcable12,ycable12,[0.8,0.6,0.2],...
xcable13,ycable13,[0.8,0.6,0.2],...
xcable14,ycable14,[0.8,0.6,0.2],...
xcable15,ycable15,[0.8,0.6,0.2],...
xcable16,ycable16,[0.8,0.6,0.2],...
xcurr1,ycurr1,[0.0,0.0,0.0],...
xcurrij1,ycurrij1,[0.0,0.0,0.0],...
xcurr2,ycurr2,[0.0,0.0,0.0],...
xcurr3,ycurr3,[0.0,0.0,0.0],...
xcurr4,ycurr4,[0.0,0.0,0.0],...
'LineStyle','None')

text(-11,11,'Από το αρχικό κύκλωμα που φαίνεται παρακάτω ισχύουν οι σχέσεις  $V_{ab}=R_{4}(J_{1}-I_{1})+R_{5}(J_{1}+I_{1})$  και  $V_{ab}=-R_{3}(J_{1}-I_{1})-R_{2}(J_{1}+I_{1})+V_{1}$ .'
text(-11,10,'Αυτές επιλύονται σαν σύστημα ως προς  $V_{ab}$  και  $I_{1}$  και έχουμε  $V_{(T)}=V_{(ab)}$ ')
text(2,10.2,nVT)
text(2.7,10.2,'Volt')

text(x01+0.5,y01+1.0,'R_1','Color',[0.9,0.2,0.0])
text(x02+0.5,y02+1.0,'R_2','Color',[0.9,0.2,0.0])
text(x03+0.5,y03+1.0,'R_3','Color',[0.9,0.2,0.0])
text(x04+0.5,y04+0.8,'R_4','Color',[0.9,0.2,0.0])
text(x05+0.5,y05+0.8,'R_5','Color',[0.9,0.2,0.0])
text(x06+0.7,y06,'J_1','Color',[0.0,0.4,0.4])
text(x07-0.1,y07-1.7,'2I_1','Color',[0.0,0.4,0.4])
text(x08+0.3,y08+3.0,'I_1','Color',[0.0,0.4,0.4])
text(x08+0.5,y08+1.0,'V_1','Color',[0.0,0.2,0.9])
text(x02+1.7,y02-1.0,'I_1+J_1','Color',[0.0,0.4,0.4])
text(x04-1.1,y02-1.0,'I_1-J_1','Color',[0.0,0.4,0.4])
text(x05+0.3,y05+2.8,'I_1+J_1','Color',[0.0,0.4,0.4])
text(x03+2.1,y03-1.0,'J_1-I_1','Color',[0.0,0.4,0.4])

text(9.5,y01,'a','Color',[0.0,0.0,0.0])
text(9.5,-7.0,'b','Color',[0.0,0.0,0.0])

axis([-12,12,-12,12])
axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
else
end
```

```

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

% --- Executes on button press in pushbutton3.
function pushbutton3_Callback(hObject, eventdata, handles)
% hObject handle to pushbutton3 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
global R1;
global R2;
global R3;
global R4;
global R5;
global V1;
global J1;

global snmeio;

snmeio=snmeio-1;

if (snmeio==0)
    snmeio=3;
    end
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
    RT=(R4+R5) * (R2-R3) / (R2-R3+R5-R4);
    nRT=num2str(0.01*round(100*RT));
    I1=(V1-J1 * (R2+R3+R4+R5)) / (R5+R2-R3-R4);
    VT=R4 * (J1-I1)+R5 * (J1+I1);
    nVT=num2str(0.01*round(100*VT));
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
    if (snmeio==1)
        axes(handles.axes1);
        cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
        x_back=[-12,12,12,-12];
        y_back=[-12,-12,12,12];

        x_tableau=[-11,11,11,-11];
        y_tableau=[-11,-11,9,9];

        x01=-8;
        y01=2.5;
        th1=0;

        xres_11=x01+[0.40*sin(th1),0.40*sin(th1)+1.2*cos(th1),...
            -0.40*sin(th1)+1.2*cos(th1),-0.40*sin(th1)];
        yres_11=y01+[-0.40*cos(th1),-0.40*cos(th1)+1.2*sin(th1),...
            0.40*cos(th1)+1.2*sin(th1),0.40*cos(th1)];

        xres_12=x01+[-0.05*sin(th1),-0.05*sin(th1)+0.25*cos(th1),...
            -0.40*sin(th1)+0.3*cos(th1),...
            0.25*sin(th1)+0.45*cos(th1),...
            -0.40*sin(th1)+0.6*cos(th1),...
            0.25*sin(th1)+0.75*cos(th1),...
            -0.40*sin(th1)+0.9*cos(th1),...
            -0.05*sin(th1)+0.95*cos(th1),...
            -0.05*sin(th1)+1.2*cos(th1),...
            0.05*sin(th1)+1.2*cos(th1),...
            0.05*sin(th1)+0.95*cos(th1),...
            -0.25*sin(th1)+0.9*cos(th1),...
            0.40*sin(th1)+0.75*cos(th1),...
            -0.25*sin(th1)+0.6*cos(th1),...
            0.40*sin(th1)+0.45*cos(th1),...
            -0.25*sin(th1)+0.3*cos(th1),...
            0.05*sin(th1)+0.25*cos(th1),...
            0.05*sin(th1)];
        yres_12=y01+[0.05*cos(th1),0.05*cos(th1)+0.25*sin(th1),...
            0.40*cos(th1)+0.3*sin(th1),...
            -0.25*cos(th1)+0.45*sin(th1),...
            0.40*cos(th1)+0.6*sin(th1),...
            -0.250*cos(th1)+0.75*sin(th1),...
            0.40*cos(th1)+0.9*sin(th1),...
            0.05*cos(th1)+0.95*sin(th1),...
            0.05*cos(th1)+1.2*sin(th1),...
            -0.05*cos(th1)+1.2*sin(th1),...
            -0.05*cos(th1)+0.95*sin(th1),...
            0.25*cos(th1)+0.9*sin(th1),...
            -0.40*cos(th1)+0.75*sin(th1),...

```

```

0.25*cos(th1)+0.6*sin(th1),...
-0.40*cos(th1)+0.45*sin(th1),...
0.25*cos(th1)+0.3*sin(th1),...
-0.05*cos(th1)+0.25*sin(th1),...
-0.05*cos(th1)];

x02=-3;
y02=2.5;
th2=0;

xres_21=x02+[0.40*sin(th2),0.40*sin(th2)+1.2*cos(th2),...
-0.40*sin(th2)+1.2*cos(th2),-0.40*sin(th2)];
yres_21=y02+[-0.40*cos(th2),-0.40*cos(th2)+1.2*sin(th2),...
0.40*cos(th2)+1.2*sin(th2),0.40*cos(th2)];

xres_22=x02+[-0.05*sin(th2),-0.05*sin(th2)+0.25*cos(th2),...
-0.40*sin(th2)+0.3*cos(th2),...
0.25*sin(th2)+0.45*cos(th2),...
-0.40*sin(th2)+0.6*cos(th2),...
0.25*sin(th2)+0.75*cos(th2),...
-0.40*sin(th2)+0.9*cos(th2),...
-0.05*sin(th2)+0.95*cos(th2),...
-0.05*sin(th2)+1.2*cos(th2),...
0.05*sin(th2)+1.2*cos(th2),...
0.05*sin(th2)+0.95*cos(th2),...
-0.25*sin(th2)+0.9*cos(th2),...
0.40*sin(th2)+0.75*cos(th2),...
-0.25*sin(th2)+0.6*cos(th2),...
0.40*sin(th2)+0.45*cos(th2),...
-0.25*sin(th2)+0.3*cos(th2),...
0.05*sin(th2)+0.25*cos(th2),...
0.05*sin(th2)];
yres_22=y02+[0.05*cos(th2),0.05*cos(th2)+0.25*sin(th2),...
0.40*cos(th2)+0.3*sin(th2),...
-0.25*cos(th2)+0.45*sin(th2),...
0.40*cos(th2)+0.6*sin(th2),...
-0.250*cos(th2)+0.75*sin(th2),...
0.40*cos(th2)+0.9*sin(th2),...
0.05*cos(th2)+0.95*sin(th2),...
0.05*cos(th2)+1.2*sin(th2),...
-0.05*cos(th2)+1.2*sin(th2),...
-0.05*cos(th2)+0.95*sin(th2),...
0.25*cos(th2)+0.9*sin(th2),...
-0.40*cos(th2)+0.75*sin(th2),...
0.25*cos(th2)+0.6*sin(th2),...
-0.40*cos(th2)+0.45*sin(th2),...
0.25*cos(th2)+0.3*sin(th2),...
-0.05*cos(th2)+0.25*sin(th2),...
-0.05*cos(th2)];

x03=2;
y03=6.5;
th3=0;

xres_31=x03+[0.40*sin(th3),0.40*sin(th3)+1.2*cos(th3),...
-0.40*sin(th3)+1.2*cos(th3),-0.40*sin(th3)];
yres_31=y03+[-0.40*cos(th3),-0.40*cos(th3)+1.2*sin(th3),...
0.40*cos(th3)+1.2*sin(th3),0.40*cos(th3)];

xres_32=x03+[-0.05*sin(th3),-0.05*sin(th3)+0.25*cos(th3),...
-0.40*sin(th3)+0.3*cos(th3),...
0.25*sin(th3)+0.45*cos(th3),...
-0.40*sin(th3)+0.6*cos(th3),...
0.25*sin(th3)+0.75*cos(th3),...
-0.40*sin(th3)+0.9*cos(th3),...
-0.05*sin(th3)+0.95*cos(th3),...
-0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+0.95*cos(th3),...
-0.25*sin(th3)+0.9*cos(th3),...
0.40*sin(th3)+0.75*cos(th3),...
-0.25*sin(th3)+0.6*cos(th3),...
0.40*sin(th3)+0.45*cos(th3),...
-0.25*sin(th3)+0.3*cos(th3),...
0.05*sin(th3)+0.25*cos(th3),...
0.05*sin(th3)];
yres_32=y03+[0.05*cos(th3),0.05*cos(th3)+0.25*sin(th3),...
0.40*cos(th3)+0.3*sin(th3),...
-0.25*cos(th3)+0.45*sin(th3),...
0.40*cos(th3)+0.6*sin(th3),...
-0.250*cos(th3)+0.75*sin(th3),...

```

```

0.40*cos(th3)+0.9*sin(th3),...
0.05*cos(th3)+0.95*sin(th3),...
0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+0.95*sin(th3),...
0.25*cos(th3)+0.9*sin(th3),...
-0.40*cos(th3)+0.75*sin(th3),...
0.25*cos(th3)+0.6*sin(th3),...
-0.40*cos(th3)+0.45*sin(th3),...
0.25*cos(th3)+0.3*sin(th3),...
-0.05*cos(th3)+0.25*sin(th3),...
-0.05*cos(th3)];

x04=5;
y04=2.5;
th4=0;

xres_41=x04+[0.40*sin(th4),0.40*sin(th4)+1.2*cos(th4),...
-0.40*sin(th4)+1.2*cos(th4),-0.40*sin(th4)];
yres_41=y04+[-0.40*cos(th4),-0.40*cos(th4)+1.2*sin(th4),...
0.40*cos(th4)+1.2*sin(th4),0.40*cos(th4)];

xres_42=x04+[-0.05*sin(th4),-0.05*sin(th4)+0.25*cos(th4),...
-0.40*sin(th4)+0.3*cos(th4),...
0.25*sin(th4)+0.45*cos(th4),...
-0.40*sin(th4)+0.6*cos(th4),...
0.25*sin(th4)+0.75*cos(th4),...
-0.40*sin(th4)+0.9*cos(th4),...
-0.05*sin(th4)+0.95*cos(th4),...
-0.05*sin(th4)+1.2*cos(th4),...
0.05*sin(th4)+1.2*cos(th4),...
0.05*sin(th4)+0.95*cos(th4),...
-0.25*sin(th4)+0.9*cos(th4),...
0.40*sin(th4)+0.75*cos(th4),...
-0.25*sin(th4)+0.6*cos(th4),...
0.40*sin(th4)+0.45*cos(th4),...
-0.25*sin(th4)+0.3*cos(th4),...
0.05*sin(th4)+0.25*cos(th4),...
0.05*sin(th4)];
yres_42=y04+[0.05*cos(th4),0.05*cos(th4)+0.25*sin(th4),...
0.40*cos(th4)+0.3*sin(th4),...
-0.25*cos(th4)+0.45*sin(th4),...
0.40*cos(th4)+0.6*sin(th4),...
-0.25*cos(th4)+0.75*sin(th4),...
0.40*cos(th4)+0.9*sin(th4),...
0.05*cos(th4)+0.95*sin(th4),...
0.05*cos(th4)+1.2*sin(th4),...
-0.05*cos(th4)+1.2*sin(th4),...
-0.05*cos(th4)+0.95*sin(th4),...
0.25*cos(th4)+0.9*sin(th4),...
-0.40*cos(th4)+0.75*sin(th4),...
0.25*cos(th4)+0.6*sin(th4),...
-0.40*cos(th4)+0.45*sin(th4),...
0.25*cos(th4)+0.3*sin(th4),...
-0.05*cos(th4)+0.25*sin(th4),...
-0.05*cos(th4)];

x05=3.0;
y05=-3.0;
th5=pi/2;

xres_51=x05+[0.25*sin(th5),0.25*sin(th5)+1.6*cos(th5),...
-0.25*sin(th5)+1.6*cos(th5),-0.25*sin(th5)];
yres_51=y05+[-0.25*cos(th5),-0.25*cos(th5)+1.6*sin(th5),...
0.25*cos(th5)+1.6*sin(th5),0.25*cos(th5)];

xres_52=x05+[-0.03*sin(th5),-0.03*sin(th5)+0.33*cos(th5),...
-0.25*sin(th5)+0.4*cos(th5),...
0.10*sin(th5)+0.6*cos(th5),...
-0.25*sin(th5)+0.8*cos(th5),...
0.10*sin(th5)+1.0*cos(th5),...
-0.25*sin(th5)+1.2*cos(th5),...
-0.03*sin(th5)+1.27*cos(th5),...
-0.03*sin(th5)+1.6*cos(th5),...
0.03*sin(th5)+1.6*cos(th5),...
0.03*sin(th5)+1.27*cos(th5),...
-0.10*sin(th5)+1.2*cos(th5),...
0.25*sin(th5)+1.0*cos(th5),...
-0.10*sin(th5)+0.8*cos(th5),...
0.25*sin(th5)+0.6*cos(th5),...
0.25*sin(th5)+0.6*cos(th5),...

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```

-0.10*sin(th5)+0.4*cos(th5),...
0.03*sin(th5)+0.33*cos(th5),...
0.03*sin(th5)];
yres_52=y05+[0.03*cos(th5),0.03*cos(th5)+0.33*sin(th5),...
0.25*cos(th5)+0.4*sin(th5),...
-0.10*cos(th5)+0.6*sin(th5),...
0.25*cos(th5)+0.8*sin(th5),...
-0.10*cos(th5)+1.0*sin(th5),...
0.25*cos(th5)+1.2*sin(th5),...
0.03*cos(th5)+1.27*sin(th5),...
0.03*cos(th5)+1.6*sin(th5),...
-0.03*cos(th5)+1.6*sin(th5),...
-0.03*cos(th5)+1.27*sin(th5),...
0.10*cos(th5)+1.2*sin(th5),...
-0.25*cos(th5)+1.0*sin(th5),...
0.10*cos(th5)+0.8*sin(th5),...
-0.25*cos(th5)+0.6*sin(th5),...
0.10*cos(th5)+0.4*sin(th5),...
-0.03*cos(th5)+0.33*sin(th5),...
-0.03*cos(th5)];

x06=-9.5;
y06=-2.5;
phi6=0:0.01:2*pi;

xI1_1=x06+0.6*cos(phi6);
yI1_1=y06+0.9*sin(phi6);

xI1_2=x06+0.55*cos(phi6);
yI1_2=y06+0.85*sin(phi6);

xI1_3=x06+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI1_3=y06+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

x07=1.5;
y07=2.5;
phi7=0:0.01:2*pi;

xI2_1=x07+0.6*cos(phi7);
yI2_1=y07+0.9*sin(phi7);

xI2_2=x07+0.55*cos(phi7);
yI2_2=y07+0.85*sin(phi7);

yI2_3=y07+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
xI2_3=x07+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

x08=-4.5;
y08=-2.5;

xV1_1=x08+[-1.0,1.0,1.0,-1.0];
yV1_1=y08+[-0.05,-0.05,0.05,0.05]+0.3;

xV1_2=x08+[-0.4,0.4,0.4,-0.4];
yV1_2=y08+[-0.1,-0.1,0.1,0.1]-0.1;

xcable1=[-9.5,-9.5,x01,x01];
ycable1=y01+[0.1,-0.1,-0.1,0.1];

xcable2=[-9.55,-9.45,-9.45,-9.55];
ycable2=[y01+0.1,y01+0.1,y06+0.9,y06+0.9];

xcable3=[-9.55,-9.45,-9.45,-9.55];
ycable3=[-7.0,-7.0,y06-0.9,y06-0.9];

xcable4=[-9.5,-9.5,9.0,9.0];
ycable4=-7.0+[0.1,-0.1,-0.1,0.1];

xcable5=[x04+1.2,x04+1.2,9.0,9.0];
ycable5=y01+[0.1,-0.1,-0.1,0.1];

xcable6=[x04,x04,x07+0.6,x07+0.6];
ycable6=y01+[0.1,-0.1,-0.1,0.1];

xcable7=[x02+1.2,x02+1.2,x07-0.6,x07-0.6];
ycable7=y01+[0.1,-0.1,-0.1,0.1];

xcable8=[x02,x02,x01+1.2,x01+1.2];

```

```

ycable8=y01+[0.1,-0.1,-0.1,0.1];

xcable9=x08+[-0.05,0.05,0.05,-0.05];
ycable9=[y01+0.1,y01+0.1,y08+0.35,y08+0.35];

xcable10=x08+[-0.05,0.05,0.05,-0.05];
ycable10=[-7.0,-7.0,y08-0.2,y08-0.2];

xcable11=x05+[-0.05,0.05,0.05,-0.05];
ycable11=[y01+0.1,y01+0.1,y05+1.6,y05+1.6];

xcable12=x05+[-0.05,0.05,0.05,-0.05];
ycable12=[-7.0,-7.0,y05,y05];

xcable13=[x07-2.0,x07-2.0,x03,x03];
ycable13=y03+[0.1,-0.1,-0.1,0.1];

xcable14=[x04+2.0,x04+2.0,x03+1.2,x03+1.2];
ycable14=y03+[0.1,-0.1,-0.1,0.1];

xcable15=x07-2.0+[-0.05,0.05,0.05,-0.05];
ycable15=[y01+0.1,y01+0.1,y03+0.1,y03+0.1];

xcable16=x04+2.0+[-0.05,0.05,0.05,-0.05];
ycable16=[y01+0.1,y01+0.1,y03+0.1,y03+0.1];

xcurr1=x08+[-0.05,0.05,0.05,0.25,0.0,-0.25,-0.05];
ycurr1=y08+2.5+[0.0,0.0,0.9,0.9,1.4,0.9,0.9];

```

```

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_11,yres_11,[1.0,1.0,1.0],...
xres_12,yres_12,[0.0,0.0,0.0],...
xres_21,yres_21,[1.0,1.0,1.0],...
xres_22,yres_22,[0.0,0.0,0.0],...
xres_31,yres_31,[1.0,1.0,1.0],...
xres_32,yres_32,[0.0,0.0,0.0],...
xres_41,yres_41,[1.0,1.0,1.0],...
xres_42,yres_42,[0.0,0.0,0.0],...
xres_51,yres_51,[1.0,1.0,1.0],...
xres_52,yres_52,[0.0,0.0,0.0],...
xi1_1,yi1_1,[0.0,0.0,0.0],...
xi1_2,yi1_2,[1.0,1.0,1.0],...
xi1_3,yi1_3,[0.0,0.0,0.0],...
xi2_1,yi2_1,[0.0,0.0,0.0],...
xi2_2,yi2_2,[1.0,1.0,1.0],...
xi2_3,yi2_3,[0.0,0.0,0.0],...
xv1_1,yv1_1,[0.0,0.0,0.0],...
xv1_2,yv1_2,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
xcable10,ycable10,[0.8,0.6,0.2],...
xcable11,ycable11,[0.8,0.6,0.2],...
xcable12,ycable12,[0.8,0.6,0.2],...
xcable13,ycable13,[0.8,0.6,0.2],...
xcable14,ycable14,[0.8,0.6,0.2],...
xcable15,ycable15,[0.8,0.6,0.2],...
xcable16,ycable16,[0.8,0.6,0.2],...
xcurr1,ycurr1,[0.0,0.0,0.0],...
'Linestyle','None')

```

text(-11,11,'Βραχυκυκλώνουμε την πηγή τάσης v_{11} και ανοίγουμε την πηγή ρεύματος J_{11} . Βάζουμε στα άκρα a, b πηγή γνωστής τάσης V_{ab} ,')
text(-11,10,'που προκαλεί ρεύμα I_{ab} . Θα έχουμε το παρακάτω κύκλωμα')

```

text(x01+0.5,y01+1.0,'R_1','Color',[0.9,0.2,0.0])
text(x02+0.5,y02+1.0,'R_2','Color',[0.9,0.2,0.0])
text(x03+0.5,y03+1.0,'R_3','Color',[0.9,0.2,0.0])
text(x04+0.5,y04+0.8,'R_4','Color',[0.9,0.2,0.0])
text(x05+0.5,y05+0.8,'R_5','Color',[0.9,0.2,0.0])
text(x06+0.7,y06,'J_1','Color',[0.0,0.4,0.4])
text(x07-0.1,y07-1.7,'2I_1','Color',[0.0,0.4,0.4])

```

```

text(x08+0.3,y08+3.0,'I_1','Color',[0.0,0.4,0.4])
text(x08+0.5,y08+1.0,'V_1','Color',[0.0,0.2,0.9])
text(9.5,y01,'a','Color',[0.0,0.0,0.0])
text(9.5,-7.0,'b','Color',[0.0,0.0,0.0])

axis([-12,12,-12,12])
axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
elseif (snmeio==2)
axes(handles.axes1);
cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,9,9];

x01=-8;
y01=2.5;
th1=0;

x02=-3;
y02=2.5;
th2=0;

xres_21=x02+[0.40*sin(th2),0.40*sin(th2)+1.2*cos(th2),...
-0.40*sin(th2)+1.2*cos(th2),-0.40*sin(th2)];
yres_21=y02+[-0.40*cos(th2),-0.40*cos(th2)+1.2*sin(th2),...
0.40*cos(th2)+1.2*sin(th2),0.40*cos(th2)];

xres_22=x02+[-0.05*sin(th2),-0.05*sin(th2)+0.25*cos(th2),...
-0.40*sin(th2)+0.3*cos(th2),...
0.25*sin(th2)+0.45*cos(th2),...
-0.40*sin(th2)+0.6*cos(th2),...
0.25*sin(th2)+0.75*cos(th2),...
-0.40*sin(th2)+0.9*cos(th2),...
-0.05*sin(th2)+0.95*cos(th2),...
-0.05*sin(th2)+1.2*cos(th2),...
0.05*sin(th2)+1.2*cos(th2),...
0.05*sin(th2)+0.95*cos(th2),...
-0.25*sin(th2)+0.9*cos(th2),...
0.40*sin(th2)+0.75*cos(th2),...
-0.25*sin(th2)+0.6*cos(th2),...
0.40*sin(th2)+0.45*cos(th2),...
-0.25*sin(th2)+0.3*cos(th2),...
0.05*sin(th2)+0.25*cos(th2),...
0.05*sin(th2)];
yres_22=y02+[0.05*cos(th2),0.05*cos(th2)+0.25*sin(th2),...
0.40*cos(th2)+0.3*sin(th2),...
-0.25*cos(th2)+0.45*sin(th2),...
0.40*cos(th2)+0.6*sin(th2),...
-0.250*cos(th2)+0.75*sin(th2),...
0.40*cos(th2)+0.9*sin(th2),...
0.05*cos(th2)+0.95*sin(th2),...
0.05*cos(th2)+1.2*sin(th2),...
-0.05*cos(th2)+1.2*sin(th2),...
-0.05*cos(th2)+0.95*sin(th2),...
0.25*cos(th2)+0.9*sin(th2),...
-0.40*cos(th2)+0.75*sin(th2),...
0.25*cos(th2)+0.6*sin(th2),...
-0.40*cos(th2)+0.45*sin(th2),...
0.25*cos(th2)+0.3*sin(th2),...
-0.05*cos(th2)+0.25*sin(th2),...
-0.05*cos(th2)];

x03=2;
y03=6.5;
th3=0;

xres_31=x03+[0.40*sin(th3),0.40*sin(th3)+1.2*cos(th3),...
-0.40*sin(th3)+1.2*cos(th3),-0.40*sin(th3)];
yres_31=y03+[-0.40*cos(th3),-0.40*cos(th3)+1.2*sin(th3),...
0.40*cos(th3)+1.2*sin(th3),0.40*cos(th3)];

xres_32=x03+[-0.05*sin(th3),-0.05*sin(th3)+0.25*cos(th3),...
-0.40*sin(th3)+0.3*cos(th3),...
0.25*sin(th3)+0.45*cos(th3),...
-0.40*sin(th3)+0.6*cos(th3),...
0.25*sin(th3)+0.75*cos(th3),...

```



```

-0.40*sin(th3)+0.9*cos(th3),...
-0.05*sin(th3)+0.95*cos(th3),...
-0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+0.95*cos(th3),...
-0.25*sin(th3)+0.9*cos(th3),...
0.40*sin(th3)+0.75*cos(th3),...
-0.25*sin(th3)+0.6*cos(th3),...
0.40*sin(th3)+0.45*cos(th3),...
-0.25*sin(th3)+0.3*cos(th3),...
0.05*sin(th3)+0.25*cos(th3),...
0.05*sin(th3)];
yres_32=y03+[0.05*cos(th3),0.05*cos(th3)+0.25*sin(th3),...
0.40*cos(th3)+0.3*sin(th3),...
-0.25*cos(th3)+0.45*sin(th3),...
0.40*cos(th3)+0.6*sin(th3),...
-0.250*cos(th3)+0.75*sin(th3),...
0.40*cos(th3)+0.9*sin(th3),...
0.05*cos(th3)+0.95*sin(th3),...
0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+0.95*sin(th3),...
0.25*cos(th3)+0.9*sin(th3),...
-0.40*cos(th3)+0.75*sin(th3),...
0.25*cos(th3)+0.6*sin(th3),...
-0.40*cos(th3)+0.45*sin(th3),...
0.25*cos(th3)+0.3*sin(th3),...
-0.05*cos(th3)+0.25*sin(th3),...
-0.05*cos(th3)];

x04=5;
y04=2.5;
th4=0;

xres_41=x04+[0.40*sin(th4),0.40*sin(th4)+1.2*cos(th4),...
-0.40*sin(th4)+1.2*cos(th4),-0.40*sin(th4)];
yres_41=y04+[-0.40*cos(th4),-0.40*cos(th4)+1.2*sin(th4),...
0.40*cos(th4)+1.2*sin(th4),0.40*cos(th4)];

xres_42=x04+[-0.05*sin(th4),-0.05*sin(th4)+0.25*cos(th4),...
-0.40*sin(th4)+0.3*cos(th4),...
0.25*sin(th4)+0.45*cos(th4),...
-0.40*sin(th4)+0.6*cos(th4),...
0.25*sin(th4)+0.75*cos(th4),...
-0.40*sin(th4)+0.9*cos(th4),...
-0.05*sin(th4)+0.95*cos(th4),...
-0.05*sin(th4)+1.2*cos(th4),...
0.05*sin(th4)+1.2*cos(th4),...
0.05*sin(th4)+0.95*cos(th4),...
-0.25*sin(th4)+0.9*cos(th4),...
0.40*sin(th4)+0.75*cos(th4),...
-0.25*sin(th4)+0.6*cos(th4),...
0.40*sin(th4)+0.45*cos(th4),...
-0.25*sin(th4)+0.3*cos(th4),...
0.05*sin(th4)+0.25*cos(th4),...
0.05*sin(th4)];
yres_42=y04+[0.05*cos(th4),0.05*cos(th4)+0.25*sin(th4),...
0.40*cos(th4)+0.3*sin(th4),...
-0.25*cos(th4)+0.45*sin(th4),...
0.40*cos(th4)+0.6*sin(th4),...
-0.250*cos(th4)+0.75*sin(th4),...
0.40*cos(th4)+0.9*sin(th4),...
0.05*cos(th4)+0.95*sin(th4),...
0.05*cos(th4)+1.2*sin(th4),...
-0.05*cos(th4)+1.2*sin(th4),...
-0.05*cos(th4)+0.95*sin(th4),...
0.25*cos(th4)+0.9*sin(th4),...
-0.40*cos(th4)+0.75*sin(th4),...
0.25*cos(th4)+0.6*sin(th4),...
-0.40*cos(th4)+0.45*sin(th4),...
0.25*cos(th4)+0.3*sin(th4),...
-0.05*cos(th4)+0.25*sin(th4),...
-0.05*cos(th4)];

x05=3.0;
y05=-3.0;
th5=pi/2;

xres_51=x05+[0.25*sin(th5),0.25*sin(th5)+1.6*cos(th5),...
-0.25*sin(th5)+1.6*cos(th5),-0.25*sin(th5)];

```

```

yres_51=y05+[-0.25*cos(th5),-0.25*cos(th5)+1.6*sin(th5),...
0.25*cos(th5)+1.6*sin(th5),0.25*cos(th5)];

xres_52=x05+[-0.03*sin(th5),-0.03*sin(th5)+0.33*cos(th5),...
-0.25*sin(th5)+0.4*cos(th5),...
0.10*sin(th5)+0.6*cos(th5),...
-0.25*sin(th5)+0.8*cos(th5),...
0.10*sin(th5)+1.0*cos(th5),...
-0.25*sin(th5)+1.2*cos(th5),...
-0.03*sin(th5)+1.27*cos(th5),...
-0.03*sin(th5)+1.6*cos(th5),...
0.03*sin(th5)+1.6*cos(th5),...
0.03*sin(th5)+1.27*cos(th5),...
-0.10*sin(th5)+1.2*cos(th5),...
0.25*sin(th5)+1.0*cos(th5),...
-0.10*sin(th5)+0.8*cos(th5),...
0.25*sin(th5)+0.6*cos(th5),...
-0.10*sin(th5)+0.4*cos(th5),...
0.03*sin(th5)+0.33*cos(th5),...
0.03*sin(th5)];

yres_52=y05+[0.03*cos(th5),0.03*cos(th5)+0.33*sin(th5),...
0.25*cos(th5)+0.4*sin(th5),...
-0.10*cos(th5)+0.6*sin(th5),...
0.25*cos(th5)+0.8*sin(th5),...
-0.10*cos(th5)+1.0*sin(th5),...
0.25*cos(th5)+1.2*sin(th5),...
0.03*cos(th5)+1.27*sin(th5),...
0.03*cos(th5)+1.6*sin(th5),...
-0.03*cos(th5)+1.6*sin(th5),...
-0.03*cos(th5)+1.27*sin(th5),...
0.10*cos(th5)+1.2*sin(th5),...
-0.25*cos(th5)+1.0*sin(th5),...
0.10*cos(th5)+0.8*sin(th5),...
-0.25*cos(th5)+0.6*sin(th5),...
0.10*cos(th5)+0.4*sin(th5),...
-0.03*cos(th5)+0.33*sin(th5),...
-0.03*cos(th5)];

x06=-9.5;
y06=-2.5;
phi6=0:0.01:2*pi;

x07=1.5;
y07=2.5;
phi7=0:0.01:2*pi;

xI2_1=x07+0.6*cos(phi7);
yI2_1=y07+0.9*sin(phi7);

xI2_2=x07+0.55*cos(phi7);
yI2_2=y07+0.85*sin(phi7);

yI2_3=y07+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
xI2_3=x07+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

x08=-4.5;
y08=-2.5;

x09=9.0;
y09=-2.5;

xv1_1=x09+[-1.0,1.0,1.0,-1.0];
yv1_1=y09+[-0.05,-0.05,0.05,0.05]+0.3;

xv1_2=x09+[-0.4,0.4,0.4,-0.4];
yv1_2=y09+[-0.1,-0.1,0.1,0.1]-0.1;

xcable4=[x08,x08,9.0,9.0];
ycable4=-7.0+[0.1,-0.1,-0.1,0.1];

xcable5=[x04+1.2,x04+1.2,9.0,9.0];
ycable5=y01+[0.1,-0.1,-0.1,0.1];

xcable6=[x04,x04,x07+0.6,x07+0.6];
ycable6=y01+[0.1,-0.1,-0.1,0.1];

```

```

xcable7=[x02+1.2,x02+1.2,x07-0.6,x07-0.6];
ycable7=y01+[0.1,-0.1,-0.1,0.1];

xcable8=[x02,x02,x08,x08];
ycable8=y01+[0.1,-0.1,-0.1,0.1];

xcable9=x08+[-0.05,0.05,0.05,-0.05];
ycable9=[y01+0.1,y01+0.1,y08+0.35,y08+0.35];

xcable10=x08+[-0.05,0.05,0.05,-0.05];
ycable10=[-7.0,-7.0,y08+0.35,y08+0.35];

xcable11=x05+[-0.05,0.05,0.05,-0.05];
ycable11=[y01+0.1,y01+0.1,y05+1.6,y05+1.6];

xcable12=x05+[-0.05,0.05,0.05,-0.05];
ycable12=[-7.0,-7.0,y05,y05];

xcable13=[x07-2.0,x07-2.0,x03,x03];
ycable13=y03+[0.1,-0.1,-0.1,0.1];

xcable14=[x04+3.0,x04+3.0,x03+1.2,x03+1.2];
ycable14=y03+[0.1,-0.1,-0.1,0.1];

xcable15=x07-2.0+[-0.05,0.05,0.05,-0.05];
ycable15=[y01+0.1,y01+0.1,y03+0.1,y03+0.1];

xcable16=x04+3.0+[-0.05,0.05,0.05,-0.05];
ycable16=[y01+0.1,y01+0.1,y03+0.1,y03+0.1];

xcable17=9.0+[-0.05,0.05,0.05,-0.05];
ycable17=[y01+0.1,y01+0.1,y09+0.35,y09+0.35];

xcable18=9.0+[-0.05,0.05,0.05,-0.05];
ycable18=[-7.0,-7.0,y09-0.2,y09-0.2];

xcurr1=x08+[-0.05,0.05,0.05,0.25,0.0,-0.25,-0.05];
ycurr1=y08+2.5+[0.0,0.0,0.9,0.9,1.4,0.9,0.9];

xcurrab=x09+[-0.05,0.05,0.05,0.25,0.0,-0.25,-0.05];
ycurrab=y09+2.5+[0.0,0.0,0.9,0.9,1.4,0.9,0.9];

xcurr3=x05+[-0.05,0.05,0.05,0.25,0.0,-0.25,-0.05];
ycurr3=y05+4.5+[0.0,0.0,-0.9,-0.9,-1.4,-0.9,-0.9];

xcurrj1=6.5+[0.0,-0.7,-0.7,-1.2,-0.7,-0.7,0.0];
ycurrj1=y03+[0.1,0.1,0.3,0.0,-0.3,-0.1,-0.1];

xcurr2=8.0+[0.0,-0.7,-0.7,-1.2,-0.7,-0.7,0.0];
ycurr2=y04+[0.1,0.1,0.3,0.0,-0.3,-0.1,-0.1];

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_21,yres_21,[1.0,1.0,1.0],...
xres_22,yres_22,[0.0,0.0,0.0],...
xres_31,yres_31,[1.0,1.0,1.0],...
xres_32,yres_32,[0.0,0.0,0.0],...
xres_41,yres_41,[1.0,1.0,1.0],...
xres_42,yres_42,[0.0,0.0,0.0],...
xres_51,yres_51,[1.0,1.0,1.0],...
xres_52,yres_52,[0.0,0.0,0.0],...
xi2_1,yi2_1,[0.0,0.0,0.0],...
xi2_2,yi2_2,[1.0,1.0,1.0],...
xi2_3,yi2_3,[0.0,0.0,0.0],...
xv1_1,yv1_1,[0.0,0.0,0.0],...
xv1_2,yv1_2,[0.0,0.0,0.0],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
xcable10,ycable10,[0.8,0.6,0.2],...
xcable11,ycable11,[0.8,0.6,0.2],...
xcable12,ycable12,[0.8,0.6,0.2],...
xcable13,ycable13,[0.8,0.6,0.2],...
xcable14,ycable14,[0.8,0.6,0.2],...
xcable15,ycable15,[0.8,0.6,0.2],...

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xcable16,ycable16,[0.8,0.6,0.2],...
xcable17,ycable17,[0.8,0.6,0.2],...
xcable18,ycable18,[0.8,0.6,0.2],...
xcurr1,ycurr1,[0.0,0.0,0.0],...
xcurr2,ycurr2,[0.0,0.0,0.0],...
xcurrab,ycurrab,[0.0,0.0,0.0],...
xcurr3,ycurr3,[0.0,0.0,0.0],...
xcurrj1,ycurrj1,[0.0,0.0,0.0],...
    'Linestyle','None')

text(-11,11,'Ισχύουν οι σχέσεις  $I_2=I_{ab}-I_1$ ,  $I_3=2I_1+I_2=I_{ab}+I_1$ ,
 $V_{ab}=R_4I_2+R_5I_3$ , και  $V_{ab}=R_3I_1-R_2I_1$ . Από αυτές με πράξεις προκύπτει')
text(-11,10,' $\bar{V}_{ab}(1+(R_5-R_4)/(R_2-R_3))=(R_4+R_5)I_{ab}$ , οπότε για την αντίσταση Thevenin θα
έχουμε')
text(4,10,' $R_T=V_{ab}/I_{ab}='$ )
text(6.5,10.2,nRT)
text(7.3,10.2,'Ohm.')

text(x02+0.5,y02+1.0,'R_2','Color',[0.9,0.2,0.0])
text(x03+0.5,y03+1.0,'R_3','Color',[0.9,0.2,0.0])
text(x04+0.5,y04+0.8,'R_4','Color',[0.9,0.2,0.0])
text(x05+0.5,y05+0.8,'R_5','Color',[0.9,0.2,0.0])
text(x07-0.1,y07-1.7,'2I_1','Color',[0.0,0.4,0.4])
text(x08+0.3,y08+3.0,'I_1','Color',[0.0,0.4,0.4])
text(x05+0.3,y05+4.0,'I_3','Color',[0.0,0.4,0.4])
text(x09+0.3,y05+3.5,'I_{ab}','Color',[0.0,0.4,0.4])
text(6.0,y03+0.8,'I_1','Color',[0.0,0.4,0.4])
text(7.5,y04+0.8,'I_2','Color',[0.0,0.4,0.4])
text(x09+0.5,y09+1.0,' $\bar{V}_{ab}$ ','Color',[0.0,0.2,0.9])
text(8.5,y01+0.5,'a','Color',[0.0,0.0,0.0])
text(8.5,-7.5,'b','Color',[0.0,0.0,0.0])

axis([-12,12,-12,12])
axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
elseif (snmeio==3)
axes(handles.axes1);
cla
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
x_back=[-12,12,12,-12];
y_back=[-12,-12,12,12];

x_tableau=[-11,11,11,-11];
y_tableau=[-11,-11,9,9];

x01=-8;
y01=2.5;
th1=0;

xres_11=x01+[0.40*sin(th1),0.40*sin(th1)+1.2*cos(th1),...
-0.40*sin(th1)+1.2*cos(th1),-0.40*sin(th1)];
yres_11=y01+[-0.40*cos(th1),-0.40*cos(th1)+1.2*sin(th1),...
0.40*cos(th1)+1.2*sin(th1),0.40*cos(th1)];

xres_12=x01+[-0.05*sin(th1),-0.05*sin(th1)+0.25*cos(th1),...
-0.40*sin(th1)+0.3*cos(th1),...
0.25*sin(th1)+0.45*cos(th1),...
-0.40*sin(th1)+0.6*cos(th1),...
0.25*sin(th1)+0.75*cos(th1),...
-0.40*sin(th1)+0.9*cos(th1),...
-0.05*sin(th1)+0.95*cos(th1),...
-0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+1.2*cos(th1),...
0.05*sin(th1)+0.95*cos(th1),...
-0.25*sin(th1)+0.9*cos(th1),...
0.40*sin(th1)+0.75*cos(th1),...
-0.25*sin(th1)+0.6*cos(th1),...
0.40*sin(th1)+0.45*cos(th1),...
-0.25*sin(th1)+0.3*cos(th1),...
0.05*sin(th1)+0.25*cos(th1),...
0.05*sin(th1)];
yres_12=y01+[0.05*cos(th1),0.05*cos(th1)+0.25*sin(th1),...
0.40*cos(th1)+0.3*sin(th1),...
-0.25*cos(th1)+0.45*sin(th1),...
0.40*cos(th1)+0.6*sin(th1),...
-0.250*cos(th1)+0.75*sin(th1),...
0.40*cos(th1)+0.9*sin(th1),...
0.05*cos(th1)+0.95*sin(th1),...
0.05*cos(th1)+1.2*sin(th1),...
-0.05*cos(th1)+1.2*sin(th1),...

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-0.05*cos(th1)+0.95*sin(th1),...
0.25*cos(th1)+0.9*sin(th1),...
-0.40*cos(th1)+0.75*sin(th1),...
0.25*cos(th1)+0.6*sin(th1),...
-0.40*cos(th1)+0.45*sin(th1),...
0.25*cos(th1)+0.3*sin(th1),...
-0.05*cos(th1)+0.25*sin(th1),...
-0.05*cos(th1)];

x02=-3;
y02=2.5;
th2=0;

xres_21=x02+[0.40*sin(th2),0.40*sin(th2)+1.2*cos(th2),...
-0.40*sin(th2)+1.2*cos(th2),-0.40*sin(th2)];
yres_21=y02+[-0.40*cos(th2),-0.40*cos(th2)+1.2*sin(th2),...
0.40*cos(th2)+1.2*sin(th2),0.40*cos(th2)];

xres_22=x02+[-0.05*sin(th2),-0.05*sin(th2)+0.25*cos(th2),...
-0.40*sin(th2)+0.3*cos(th2),...
0.25*sin(th2)+0.45*cos(th2),...
-0.40*sin(th2)+0.6*cos(th2),...
0.25*sin(th2)+0.75*cos(th2),...
-0.40*sin(th2)+0.9*cos(th2),...
-0.05*sin(th2)+0.95*cos(th2),...
-0.05*sin(th2)+1.2*cos(th2),...
0.05*sin(th2)+1.2*cos(th2),...
0.05*sin(th2)+0.95*cos(th2),...
-0.25*sin(th2)+0.9*cos(th2),...
0.40*sin(th2)+0.75*cos(th2),...
-0.25*sin(th2)+0.6*cos(th2),...
0.40*sin(th2)+0.45*cos(th2),...
-0.25*sin(th2)+0.3*cos(th2),...
0.05*sin(th2)+0.25*cos(th2),...
0.05*sin(th2)];
yres_22=y02+[0.05*cos(th2),0.05*cos(th2)+0.25*sin(th2),...
0.40*cos(th2)+0.3*sin(th2),...
-0.25*cos(th2)+0.45*sin(th2),...
0.40*cos(th2)+0.6*sin(th2),...
-0.250*cos(th2)+0.75*sin(th2),...
0.40*cos(th2)+0.9*sin(th2),...
0.05*cos(th2)+0.95*sin(th2),...
0.05*cos(th2)+1.2*sin(th2),...
-0.05*cos(th2)+1.2*sin(th2),...
-0.05*cos(th2)+0.95*sin(th2),...
0.25*cos(th2)+0.9*sin(th2),...
-0.40*cos(th2)+0.75*sin(th2),...
0.25*cos(th2)+0.6*sin(th2),...
-0.40*cos(th2)+0.45*sin(th2),...
0.25*cos(th2)+0.3*sin(th2),...
-0.05*cos(th2)+0.25*sin(th2),...
-0.05*cos(th2)];

x03=2;
y03=6.5;
th3=0;

xres_31=x03+[0.40*sin(th3),0.40*sin(th3)+1.2*cos(th3),...
-0.40*sin(th3)+1.2*cos(th3),-0.40*sin(th3)];
yres_31=y03+[-0.40*cos(th3),-0.40*cos(th3)+1.2*sin(th3),...
0.40*cos(th3)+1.2*sin(th3),0.40*cos(th3)];

xres_32=x03+[-0.05*sin(th3),-0.05*sin(th3)+0.25*cos(th3),...
-0.40*sin(th3)+0.3*cos(th3),...
0.25*sin(th3)+0.45*cos(th3),...
-0.40*sin(th3)+0.6*cos(th3),...
0.25*sin(th3)+0.75*cos(th3),...
-0.40*sin(th3)+0.9*cos(th3),...
-0.05*sin(th3)+0.95*cos(th3),...
-0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+1.2*cos(th3),...
0.05*sin(th3)+0.95*cos(th3),...
-0.25*sin(th3)+0.9*cos(th3),...
0.40*sin(th3)+0.75*cos(th3),...
-0.25*sin(th3)+0.6*cos(th3),...
0.40*sin(th3)+0.45*cos(th3),...
-0.25*sin(th3)+0.3*cos(th3),...
0.05*sin(th3)+0.25*cos(th3),...
0.05*sin(th3)];
yres_32=y03+[0.05*cos(th3),0.05*cos(th3)+0.25*sin(th3),...
0.40*cos(th3)+0.3*sin(th3),...

```

```

-0.25*cos(th3)+0.45*sin(th3),...
 0.40*cos(th3)+0.6*sin(th3),...
-0.250*cos(th3)+0.75*sin(th3),...
 0.40*cos(th3)+0.9*sin(th3),...
 0.05*cos(th3)+0.95*sin(th3),...
 0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+1.2*sin(th3),...
-0.05*cos(th3)+0.95*sin(th3),...
 0.25*cos(th3)+0.9*sin(th3),...
-0.40*cos(th3)+0.75*sin(th3),...
 0.25*cos(th3)+0.6*sin(th3),...
-0.40*cos(th3)+0.45*sin(th3),...
 0.25*cos(th3)+0.3*sin(th3),...
-0.05*cos(th3)+0.25*sin(th3),...
  -0.05*cos(th3)];

x04=5;
y04=2.5;
th4=0;

xres_41=x04+[0.40*sin(th4),0.40*sin(th4)+1.2*cos(th4),...
 -0.40*sin(th4)+1.2*cos(th4),-0.40*sin(th4)];
yres_41=y04+[-0.40*cos(th4),-0.40*cos(th4)+1.2*sin(th4),...
 0.40*cos(th4)+1.2*sin(th4),0.40*cos(th4)];

xres_42=x04+[-0.05*sin(th4),-0.05*sin(th4)+0.25*cos(th4),...
 -0.40*sin(th4)+0.3*cos(th4),...
 0.25*sin(th4)+0.45*cos(th4),...
 -0.40*sin(th4)+0.6*cos(th4),...
 0.25*sin(th4)+0.75*cos(th4),...
 -0.40*sin(th4)+0.9*cos(th4),...
 -0.05*sin(th4)+0.95*cos(th4),...
 -0.05*sin(th4)+1.2*cos(th4),...
 0.05*sin(th4)+1.2*cos(th4),...
 0.05*sin(th4)+0.95*cos(th4),...
 -0.25*sin(th4)+0.9*cos(th4),...
 0.40*sin(th4)+0.75*cos(th4),...
 -0.25*sin(th4)+0.6*cos(th4),...
 0.40*sin(th4)+0.45*cos(th4),...
 -0.25*sin(th4)+0.3*cos(th4),...
 0.05*sin(th4)+0.25*cos(th4),...
 0.05*sin(th4)];
yres_42=y04+[0.05*cos(th4),0.05*cos(th4)+0.25*sin(th4),...
 0.40*cos(th4)+0.3*sin(th4),...
 -0.25*cos(th4)+0.45*sin(th4),...
 0.40*cos(th4)+0.6*sin(th4),...
 -0.250*cos(th4)+0.75*sin(th4),...
 0.40*cos(th4)+0.9*sin(th4),...
 0.05*cos(th4)+0.95*sin(th4),...
 0.05*cos(th4)+1.2*sin(th4),...
 -0.05*cos(th4)+1.2*sin(th4),...
 -0.05*cos(th4)+0.95*sin(th4),...
 0.25*cos(th4)+0.9*sin(th4),...
 -0.40*cos(th4)+0.75*sin(th4),...
 0.25*cos(th4)+0.6*sin(th4),...
 -0.40*cos(th4)+0.45*sin(th4),...
 0.25*cos(th4)+0.3*sin(th4),...
 -0.05*cos(th4)+0.25*sin(th4),...
 -0.05*cos(th4)];

x05=3.0;
y05=-3.0;
th5=pi/2;

xres_51=x05+[0.25*sin(th5),0.25*sin(th5)+1.6*cos(th5),...
 -0.25*sin(th5)+1.6*cos(th5),-0.25*sin(th5)];
yres_51=y05+[-0.25*cos(th5),-0.25*cos(th5)+1.6*sin(th5),...
 0.25*cos(th5)+1.6*sin(th5),0.25*cos(th5)];

xres_52=x05+[-0.03*sin(th5),-0.03*sin(th5)+0.33*cos(th5),...
 -0.25*sin(th5)+0.4*cos(th5),...
 0.10*sin(th5)+0.6*cos(th5),...
 -0.25*sin(th5)+0.8*cos(th5),...
 0.10*sin(th5)+1.0*cos(th5),...
 -0.25*sin(th5)+1.2*cos(th5),...
 -0.03*sin(th5)+1.27*cos(th5),...
 -0.03*sin(th5)+1.6*cos(th5),...
 0.03*sin(th5)+1.6*cos(th5),...
 0.03*sin(th5)+1.27*cos(th5),...
 -0.10*sin(th5)+1.2*cos(th5),...

```

```

0.25*sin(th5)+1.0*cos(th5),...
-0.10*sin(th5)+0.8*cos(th5),...
0.25*sin(th5)+0.6*cos(th5),...
-0.10*sin(th5)+0.4*cos(th5),...
0.03*sin(th5)+0.33*cos(th5),...
0.03*sin(th5)];
yres_52=y05+[0.03*cos(th5),0.03*cos(th5)+0.33*sin(th5),...
0.25*cos(th5)+0.4*sin(th5),...
-0.10*cos(th5)+0.6*sin(th5),...
0.25*cos(th5)+0.8*sin(th5),...
-0.10*cos(th5)+1.0*sin(th5),...
0.25*cos(th5)+1.2*sin(th5),...
0.03*cos(th5)+1.27*sin(th5),...
0.03*cos(th5)+1.6*sin(th5),...
-0.03*cos(th5)+1.6*sin(th5),...
-0.03*cos(th5)+1.27*sin(th5),...
0.10*cos(th5)+1.2*sin(th5),...
-0.25*cos(th5)+1.0*sin(th5),...
0.10*cos(th5)+0.8*sin(th5),...
-0.25*cos(th5)+0.6*sin(th5),...
0.10*cos(th5)+0.4*sin(th5),...
-0.03*cos(th5)+0.33*sin(th5),...
-0.03*cos(th5)];

x06=-9.5;
y06=-2.5;
phi6=0:0.01:2*pi;

xI1_1=x06+0.6*cos(phi6);
yI1_1=y06+0.9*sin(phi6);

xI1_2=x06+0.55*cos(phi6);
yI1_2=y06+0.85*sin(phi6);

xI1_3=x06+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
yI1_3=y06+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

x07=1.5;
y07=2.5;
phi7=0:0.01:2*pi;

xI2_1=x07+0.6*cos(phi7);
yI2_1=y07+0.9*sin(phi7);

xI2_2=x07+0.55*cos(phi7);
yI2_2=y07+0.85*sin(phi7);

yI2_3=y07+[0.05,0.35,0.0,-0.35,-0.05,-0.05,0.05];
xI2_3=x07+[0.1,0.1,0.5,0.1,0.1,-0.5,-0.5];

x08=-4.5;
y08=-2.5;

xV1_1=x08+[-1.0,1.0,1.0,-1.0];
yV1_1=y08+[-0.05,-0.05,0.05,0.05]+0.3;

xV1_2=x08+[-0.4,0.4,0.4,-0.4];
yV1_2=y08+[-0.1,-0.1,0.1,0.1]-0.1;

xcable1=[-9.5,-9.5,x01,x01];
ycable1=y01+[0.1,-0.1,-0.1,0.1];

xcable2=[-9.55,-9.45,-9.45,-9.55];
ycable2=[y01+0.1,y01+0.1,y06+0.9,y06+0.9];

xcable3=[-9.55,-9.45,-9.45,-9.55];
ycable3=[-7.0,-7.0,y06-0.9,y06-0.9];

xcable4=[-9.5,-9.5,9.0,9.0];
ycable4=-7.0+[0.1,-0.1,-0.1,0.1];

xcable5=[x04+1.2,x04+1.2,9.0,9.0];
ycable5=y01+[0.1,-0.1,-0.1,0.1];

xcable6=[x04,x04,x07+0.6,x07+0.6];
ycable6=y01+[0.1,-0.1,-0.1,0.1];

xcable7=[x02+1.2,x02+1.2,x07-0.6,x07-0.6];

```

```

ycable7=y01+[0.1,-0.1,-0.1,0.1];

xcable8=[x02,x02,x01+1.2,x01+1.2];
ycable8=y01+[0.1,-0.1,-0.1,0.1];

xcable9=x08+[-0.05,0.05,0.05,-0.05];
ycable9=[y01+0.1,y01+0.1,y08+0.35,y08+0.35];

xcable10=x08+[-0.05,0.05,0.05,-0.05];
ycable10=[-7.0,-7.0,y08-0.2,y08-0.2];

xcable11=x05+[-0.05,0.05,0.05,-0.05];
ycable11=[y01+0.1,y01+0.1,y05+1.6,y05+1.6];

xcable12=x05+[-0.05,0.05,0.05,-0.05];
ycable12=[-7.0,-7.0,y05,y05];

xcable13=[x07-2.0,x07-2.0,x03,x03];
ycable13=y03+[0.1,-0.1,-0.1,0.1];

xcable14=[x04+2.0,x04+2.0,x03+1.2,x03+1.2];
ycable14=y03+[0.1,-0.1,-0.1,0.1];

xcable15=x07-2.0+[-0.05,0.05,0.05,-0.05];
ycable15=[y01+0.1,y01+0.1,y03+0.1,y03+0.1];

xcable16=x04+2.0+[-0.05,0.05,0.05,-0.05];
ycable16=[y01+0.1,y01+0.1,y03+0.1,y03+0.1];

xcurr1=x08+[-0.05,0.05,0.05,0.25,0.0,-0.25,-0.05];
ycurr1=y08+2.5+[0.0,0.0,0.9,0.9,1.4,0.9,0.9];

xcurr1j1=x05+[-0.05,0.05,0.05,0.25,0.0,-0.25,-0.05];
ycurr1j1=y05+4.5+[0.0,0.0,-0.9,-0.9,-1.4,-0.9,-0.9];

xcurr2=x02+1.3+[0.0,0.0,0.7,0.7,1.2,0.7,0.7];
ycurr2=y02+[0.1,-0.1,-0.1,-0.25,0.0,0.25,0.1];

xcurr3=x03+1.9+[0.0,0.0,0.7,0.7,1.2,0.7,0.7];
ycurr3=y03+[0.1,-0.1,-0.1,-0.25,0.0,0.25,0.1];

xcurr4=x04-1.5+[0.0,0.0,0.7,0.7,1.2,0.7,0.7];
ycurr4=y02+[0.1,-0.1,-0.1,-0.25,0.0,0.25,0.1];

fill(x_back,y_back,[1.0,1.0,1.0],...
x_tableau,y_tableau,[0.6,0.6,0.6],...
xres_11,yres_11,[1.0,1.0,1.0],...
xres_12,yres_12,[0.0,0.0,0.0],...
xres_21,yres_21,[1.0,1.0,1.0],...
xres_22,yres_22,[0.0,0.0,0.0],...
xres_31,yres_31,[1.0,1.0,1.0],...
xres_32,yres_32,[0.0,0.0,0.0],...
xres_41,yres_41,[1.0,1.0,1.0],...
xres_42,yres_42,[0.0,0.0,0.0],...
xres_51,yres_51,[1.0,1.0,1.0],...
xres_52,yres_52,[0.0,0.0,0.0],...
xi1_1,yi1_1,[0.0,0.0,0.0],...
xi1_2,yi1_2,[1.0,1.0,1.0],...
xi1_3,yi1_3,[0.0,0.0,0.0],...
xi2_1,yi2_1,[0.0,0.0,0.0],...
xi2_2,yi2_2,[1.0,1.0,1.0],...
xi2_3,yi2_3,[0.0,0.0,0.0],...
xv1_1,yv1_1,[0.0,0.0,0.0],...
xv1_2,yv1_2,[0.0,0.0,0.0],...
xcable1,ycable1,[0.8,0.6,0.2],...
xcable2,ycable2,[0.8,0.6,0.2],...
xcable3,ycable3,[0.8,0.6,0.2],...
xcable4,ycable4,[0.8,0.6,0.2],...
xcable5,ycable5,[0.8,0.6,0.2],...
xcable6,ycable6,[0.8,0.6,0.2],...
xcable7,ycable7,[0.8,0.6,0.2],...
xcable8,ycable8,[0.8,0.6,0.2],...
xcable9,ycable9,[0.8,0.6,0.2],...
xcable10,ycable10,[0.8,0.6,0.2],...
xcable11,ycable11,[0.8,0.6,0.2],...
xcable12,ycable12,[0.8,0.6,0.2],...
xcable13,ycable13,[0.8,0.6,0.2],...
xcable14,ycable14,[0.8,0.6,0.2],...

```



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xcable15,ycable15,[0.8,0.6,0.2],...
xcable16,ycable16,[0.8,0.6,0.2],...
xcurr1,ycurr1,[0.0,0.0,0.0],...
xcurrij1,ycurrij1,[0.0,0.0,0.0],...
xcurr2,ycurr2,[0.0,0.0,0.0],...
xcurr3,ycurr3,[0.0,0.0,0.0],...
xcurr4,ycurr4,[0.0,0.0,0.0],...
'LineStyle','None')

text(-11,11,'Από το αρχικό κύκλωμα που φαίνεται παρακάτω ισχύουν οι σχέσεις  $V_{ab}=R_4(J_{11}-I_{11})+R_5(J_{11}+I_{11})$  και  $V_{ab}=-R_3(J_{11}-I_{11})-R_2(J_{11}+I_{11})+V_1$ .')
text(-11,10,'Αυτές επιλύονται σαν σύστημα ως προς  $V_{ab}$  και  $I_{11}$  και έχουμε  $V_T=V_{ab}=$ ')
text(2,10.2,nVT)
text(2.7,10.2,'Volt')

text(x01+0.5,y01+1.0,'R_1','Color',[0.9,0.2,0.0])
text(x02+0.5,y02+1.0,'R_2','Color',[0.9,0.2,0.0])
text(x03+0.5,y03+1.0,'R_3','Color',[0.9,0.2,0.0])
text(x04+0.5,y04+0.8,'R_4','Color',[0.9,0.2,0.0])
text(x05+0.5,y05+0.8,'R_5','Color',[0.9,0.2,0.0])
text(x06+0.7,y06,'J_1','Color',[0.0,0.4,0.4])
text(x07-0.1,y07-1.7,'2I_1','Color',[0.0,0.4,0.4])
text(x08+0.3,y08+3.0,'I_1','Color',[0.0,0.4,0.4])
text(x08+0.5,y08+1.0,'V_1','Color',[0.0,0.2,0.9])
text(x02+1.7,y02-1.0,'I_1+J_1','Color',[0.0,0.4,0.4])
text(x04-1.1,y02-1.0,'I_1-J_1','Color',[0.0,0.4,0.4])
text(x05+0.3,y05+2.8,'I_1+J_1','Color',[0.0,0.4,0.4])
text(x03+2.1,y03-1.0,'J_1-I_1','Color',[0.0,0.4,0.4])

text(9.5,y01,'a','Color',[0.0,0.0,0.0])
text(9.5,-7.0,'b','Color',[0.0,0.0,0.0])

axis([-12,12,-12,12])
axis off;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
else
end

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

% --- Executes on button press in pushbutton4.
function pushbutton4_Callback(hObject, eventdata, handles)
% hObject handle to pushbutton4 (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)
hfin=questdlg('Εξοδος από το πρόγραμμα?');
switch hfin
case 'Yes'
closereq;
end

```