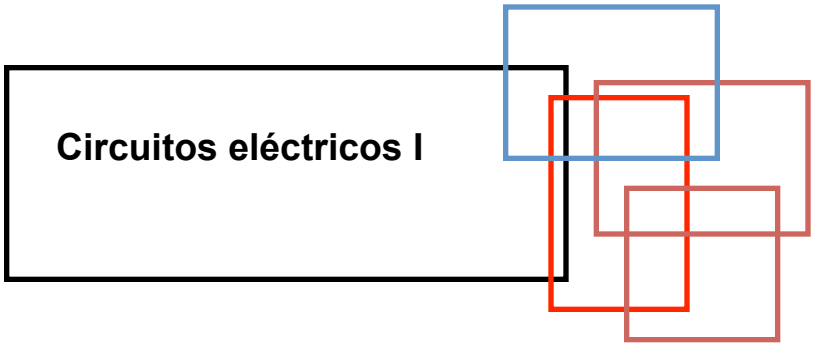
Ejemplos del capítulo 3



Página 38, libro de texto

PRACTICE

3.1 Count the number of branches and nodes in the circuit in Fig. 3.4. If $i_x = 3$ A and the 18 V source delivers 8 A of current, what is the value of R_A? (Hint: You need Ohm's law as well as KCL.)

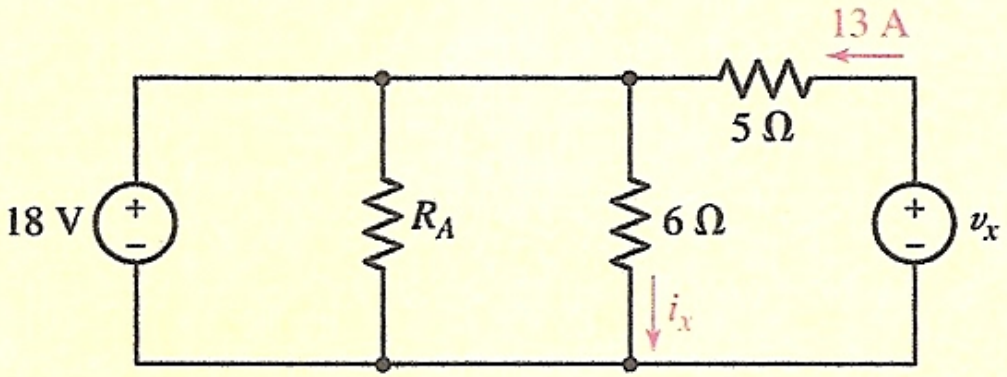


FIGURE 3.4

Ans: 5 branches, 3 nodes, 1Ω.

Problema 3.2 página 63

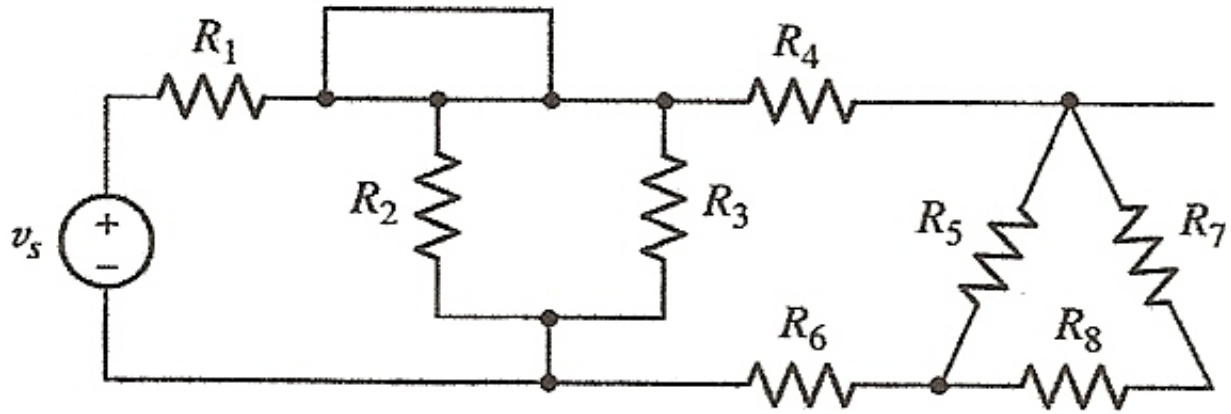


FIGURE 3.42

2. In the circuit of Fig. 3.42, count the number of (*a*) nodes; (*b*) branches.

Problema 3.6 página 64

6. (*a*) Determine the current labeled i_z in the circuit shown in Fig. 3.45. (*b*) If the resistor carrying 3 A has a value of 1 Ω, what is the value of the resistor carrying −5 A?

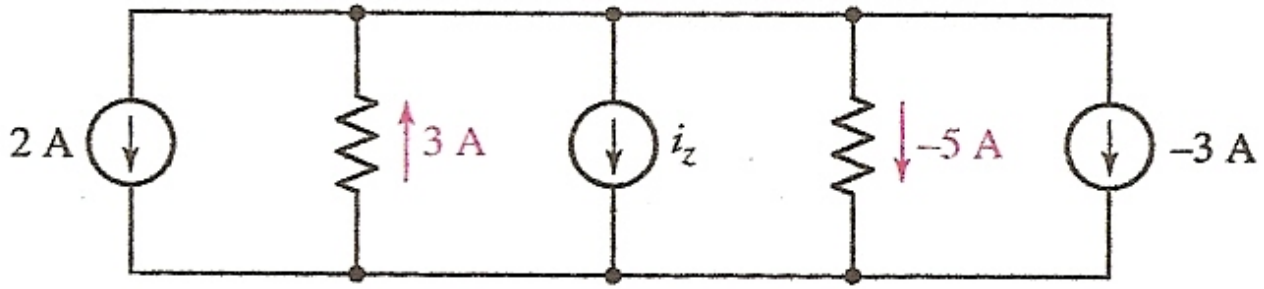


FIGURE 3.45

Problema 3.8 página 64

8. Referring to Fig. 3.47,

(*a*) Find i_x if $i_y = 2$ A and $i_z = 0$ A. (*b*) Find i_y if $i_x = 2$ A and $i_z = 2\,i_y$.
(*c*) Find i_z if $i_x = i_y = i_z$.

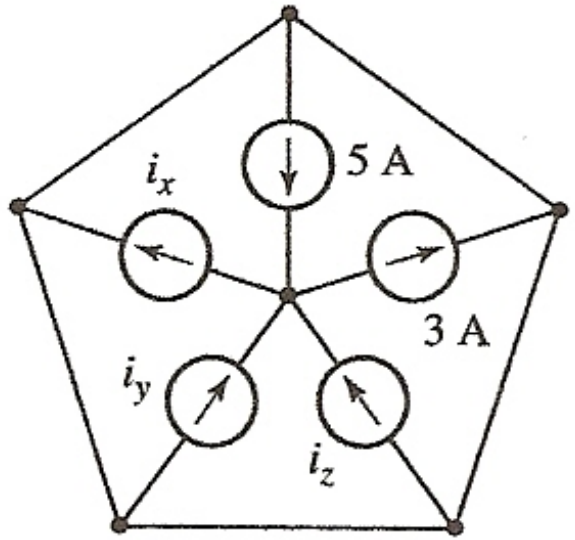


FIGURE 3.47

Problema 3.9 página 64

9. Find i_x and i_y in the circuit of Fig. 3.48.

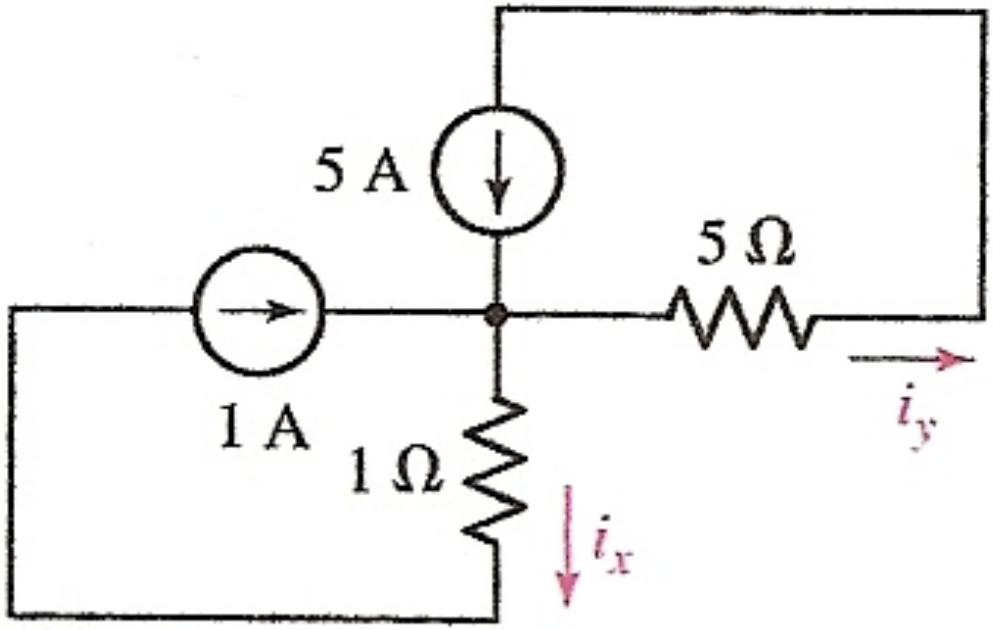


FIGURE 3.48

Problema 3.13 página 65

13. In the circuit of Fig. 3.50,

(*a*) Calculate v_y if $i_z = -3$ A.

(*b*) What voltage would need to replace the 5 V source to obtain $v_y = -6$ V if $i_z = 0.5$ A?

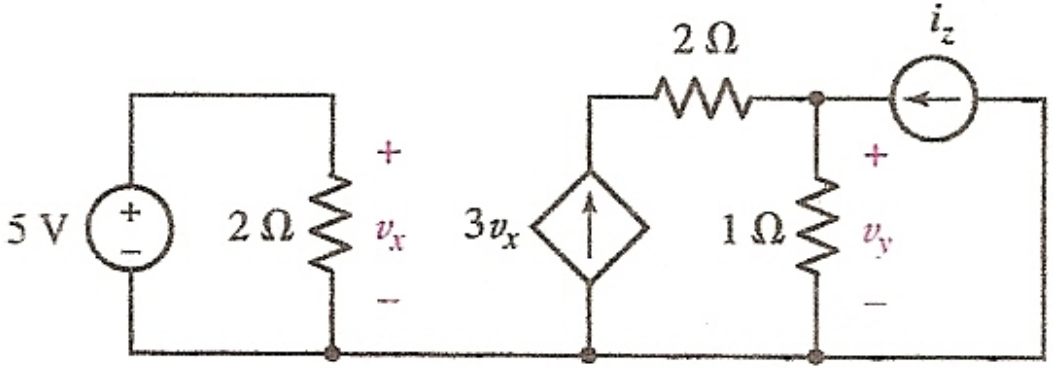
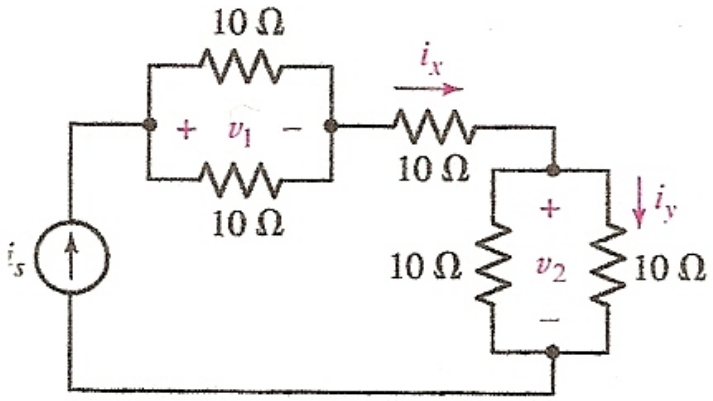


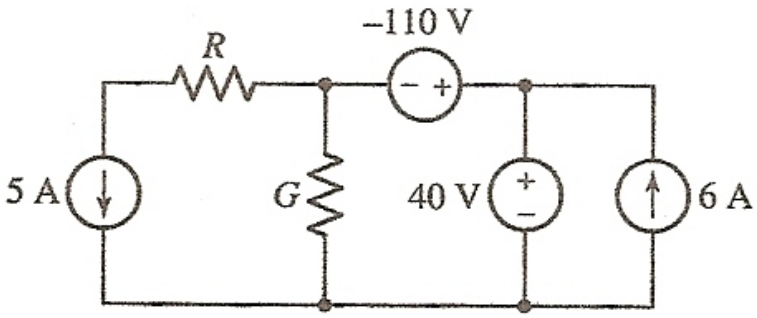
FIGURE 3.50

Problema 3.15 página 65

15. Find R and G in the circuit of Fig. 3.51*b* if the 5 A source is supplying 100 W and the 40 V source is supplying 500 W.



(*a*)



(*b*)

FIGURE 3.51

Problema 3.16 página 66

16. In the circuits of Fig. 3.52*a* and *b*, determine the current labeled *i*.

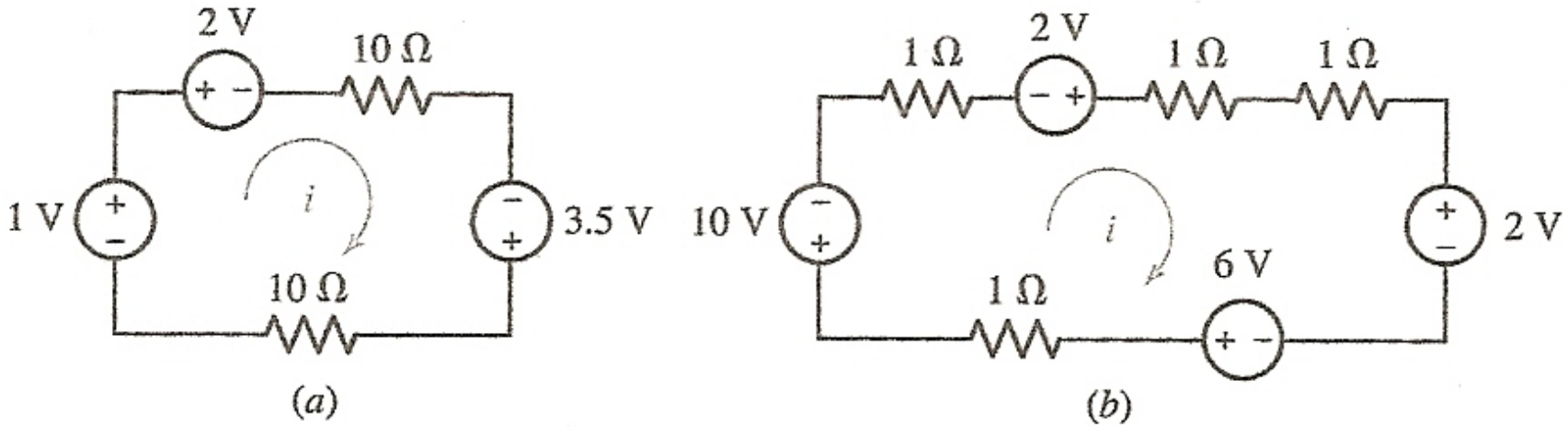
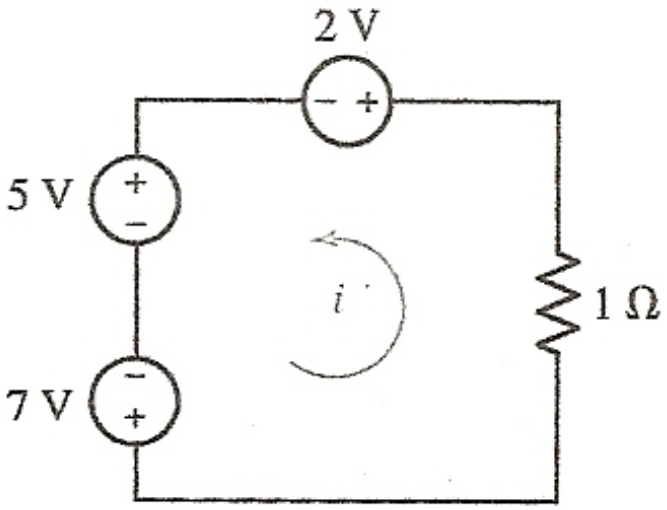


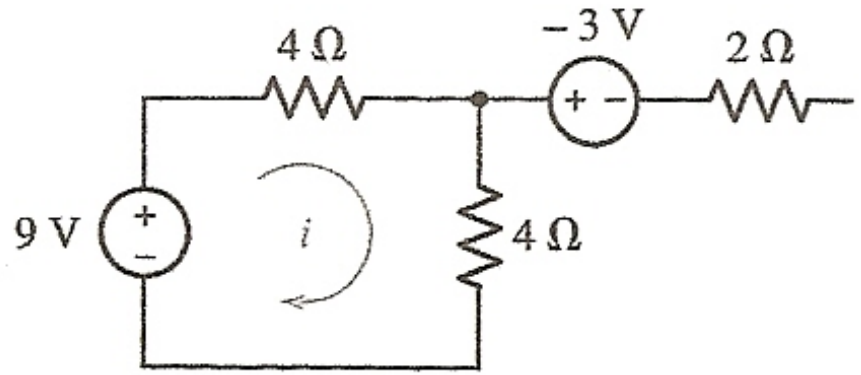
FIGURE 3.52

Problema 3.17 página 66

17. Calculate the value of i in each circuit of Fig. 3.53.



(a)



(b)

FIGURE 3.53

Problema 3.18 página 66

18. Consider the simple circuit shown in Fig. 3.54. Using KVL, derive the expressions

$$v_1 = v_s \frac{R_1}{R_1 + R_2} \quad \text{and} \quad v_2 = v_s \frac{R_2}{R_1 + R_2}$$

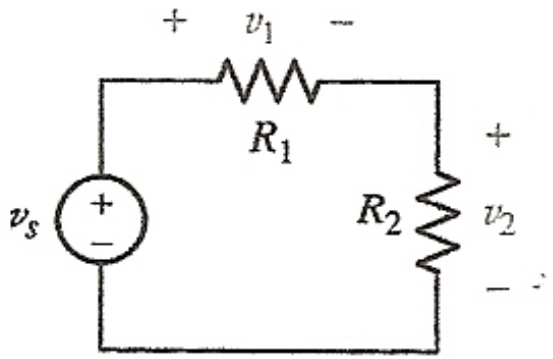


FIGURE 3.54

Problema 3.30 página 68

30. Find the power absorbed by each of the six circuit elements in Fig. 3.63, and show that they sum to zero.

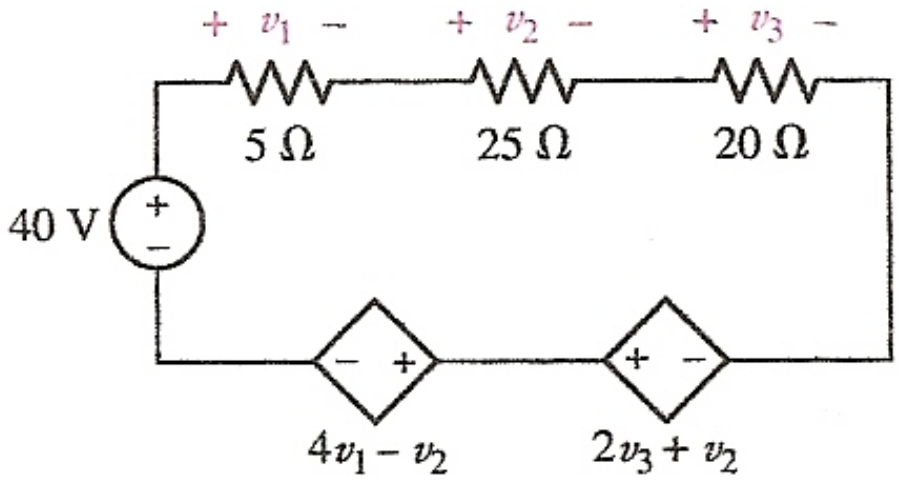


FIGURE 3.63

Problema 3.35 página 69

35. Find the power absorbed by each circuit element of Fig. 3.68 if the control for the dependent source is (*a*) $0.8i_x$; (*b*) $0.8i_y$. In each case, demonstrate that the absorbed power quantities sum to zero.

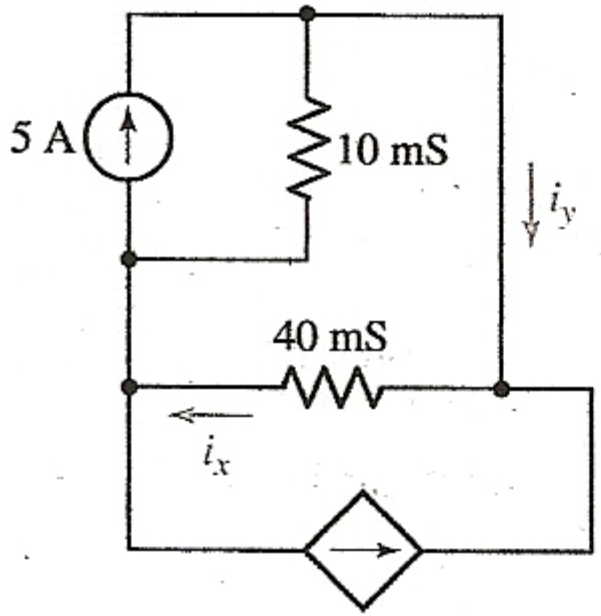


FIGURE 3.68

Problema 3.36 página 69

Find i_x in the circuit of Fig. 3.69.

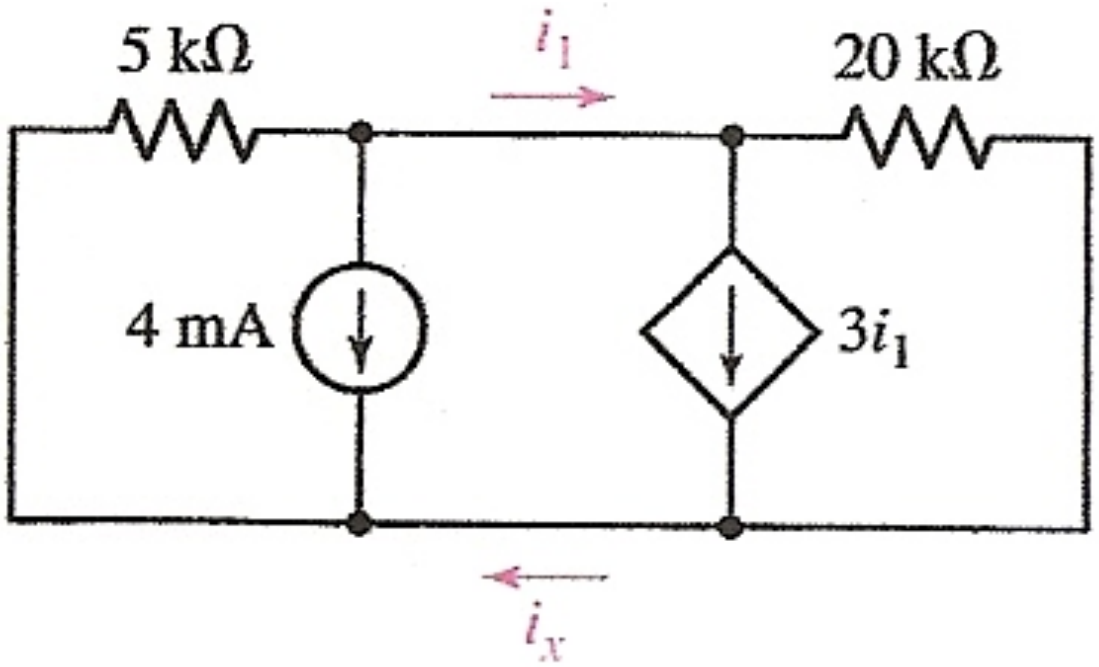


FIGURE 3.69

Problema 3.37 página 69

37. Find the power absorbed by each element in the single-node-pair circuit of Fig. 3.70, and show that the sum is equal to zero.

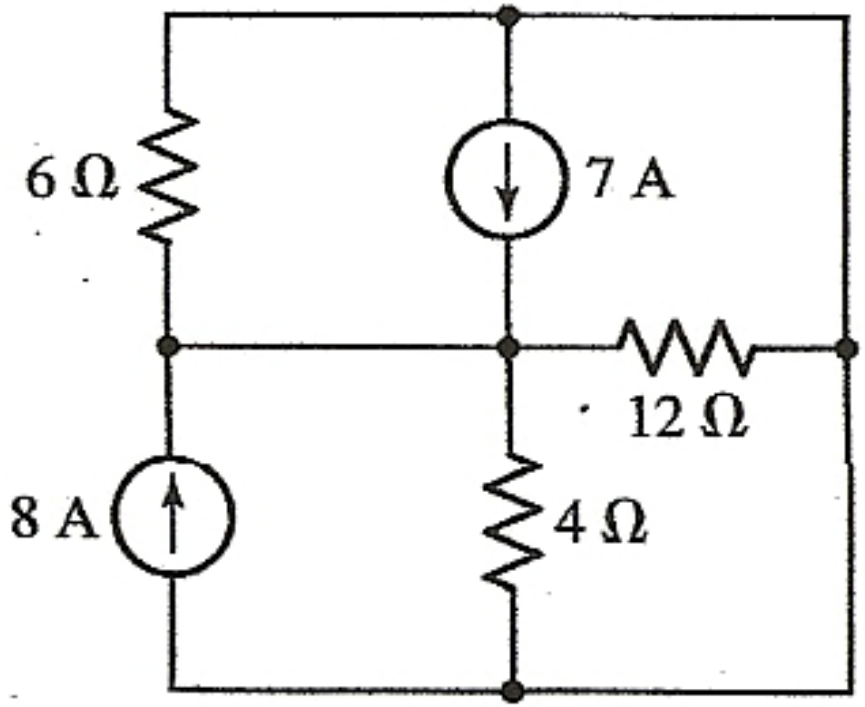
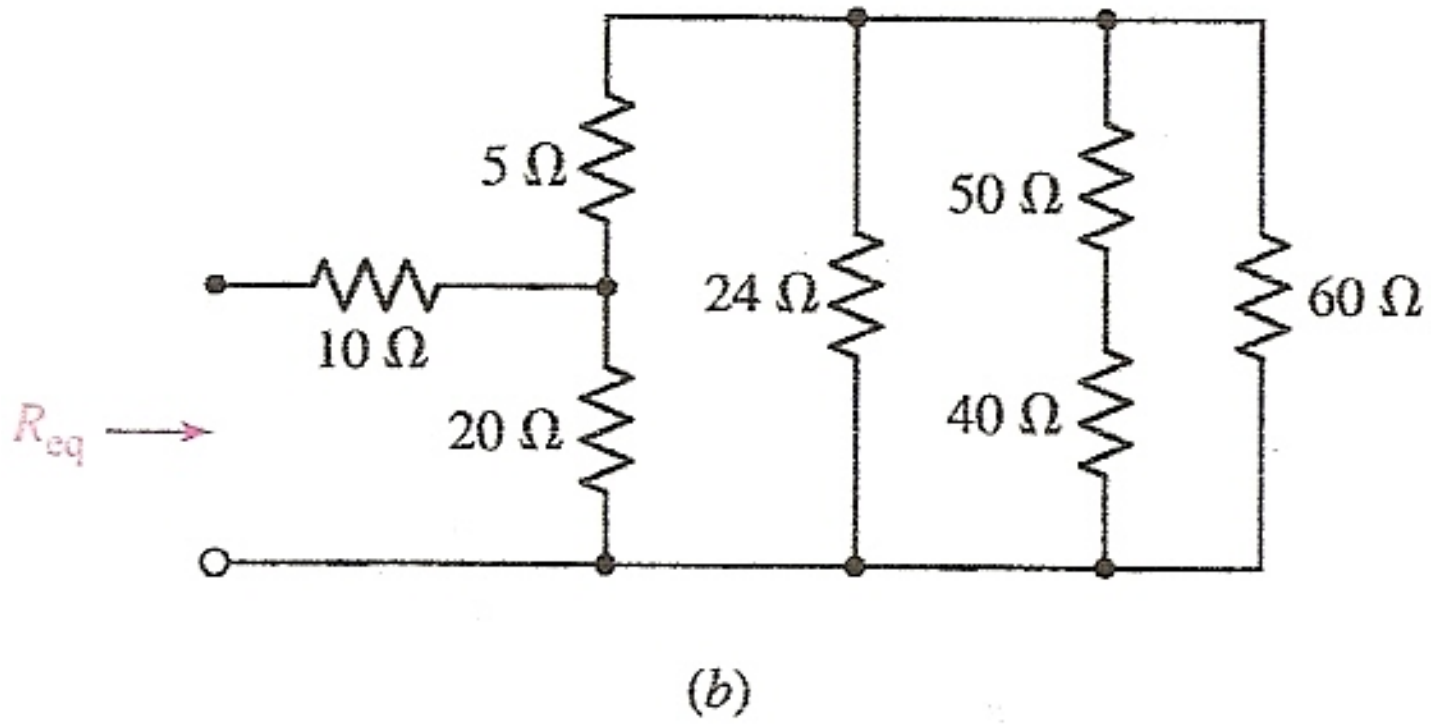


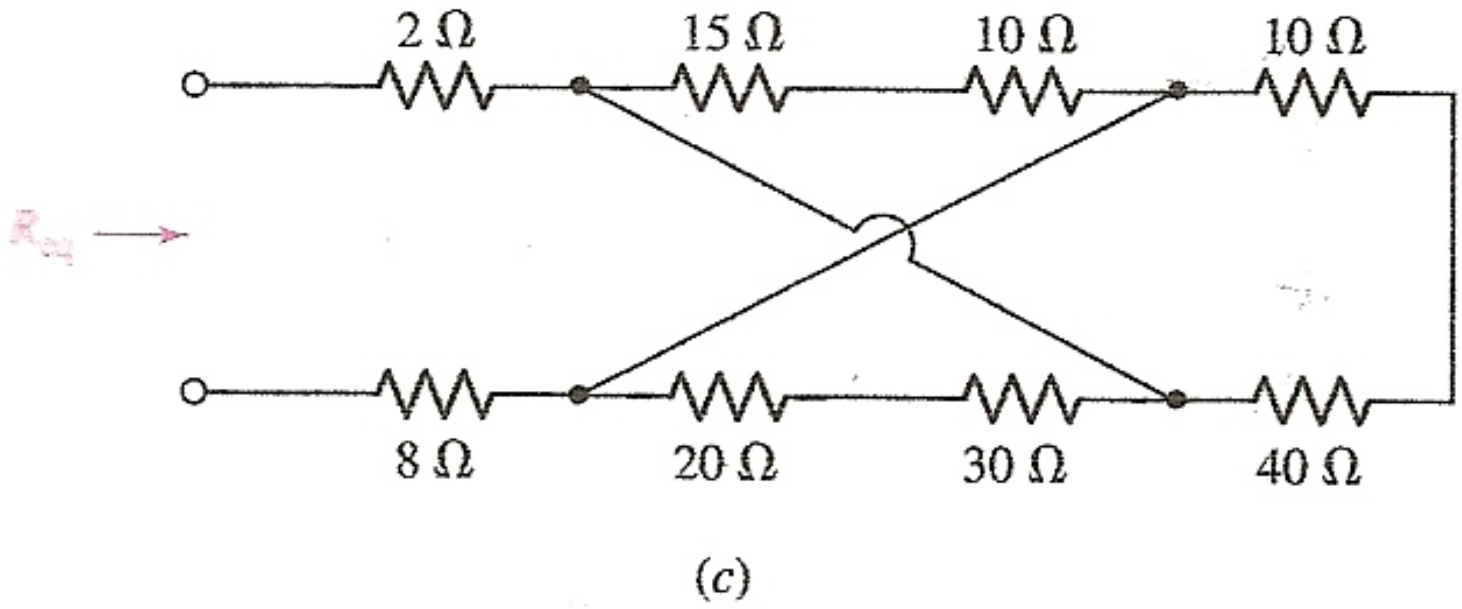
FIGURE 3.70

Problema 3.58 página 73



(b)

Problema 3.58 página 73



(c)

FIGURE 3.89

Problema 3.64, página 64

64. Use both resistance and source combinations, as well as current division, in the circuit of Fig. 3.94 to find the power absorbed by the 1 Ω, 10 Ω, and 13 Ω resistors.

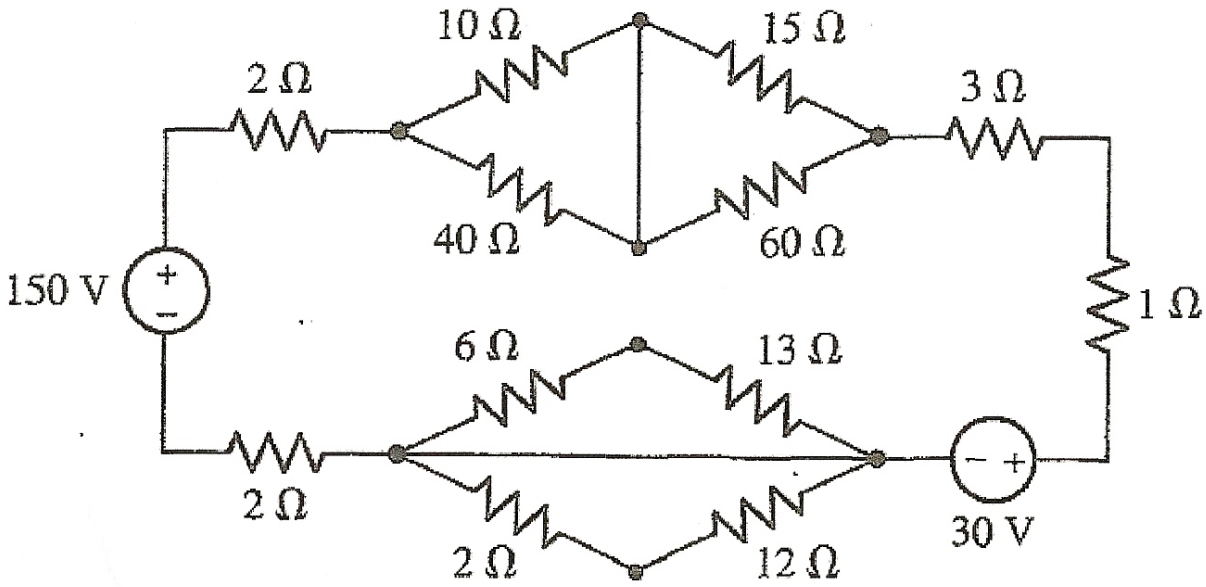
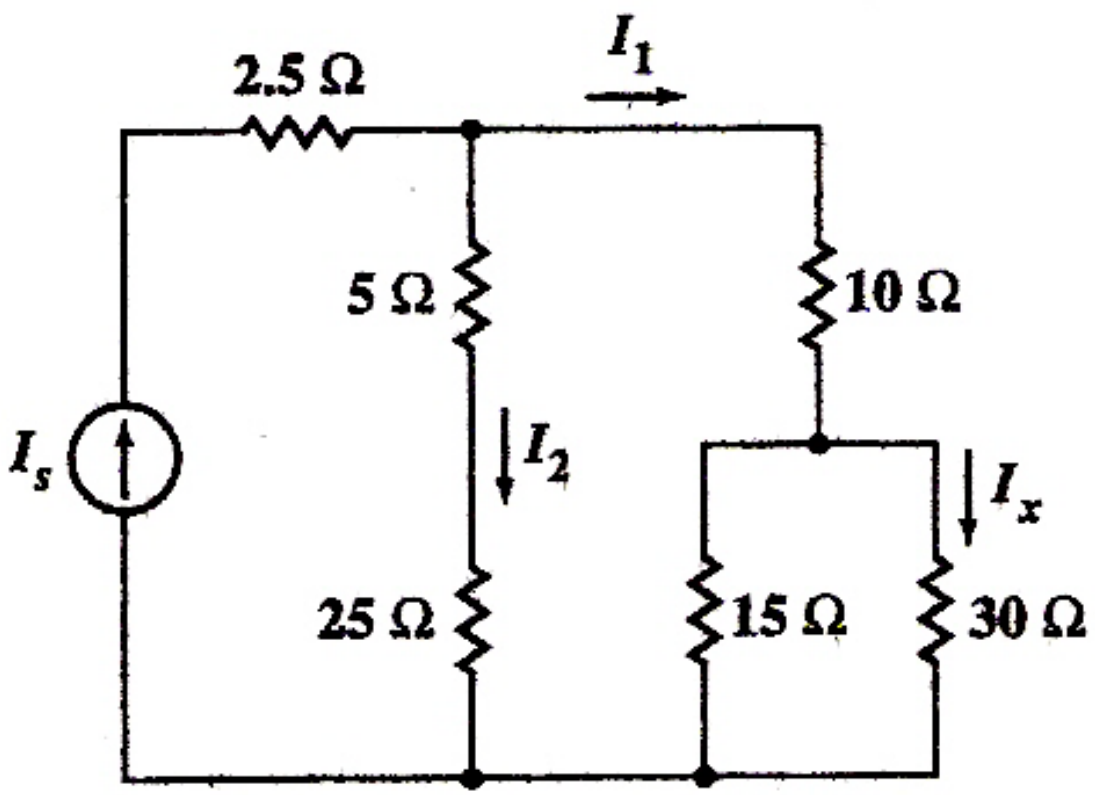


FIGURE 3.94

Problema 3.82 página 78

Para el circuito de la figura P3 determine la corriente i_x si I_S=60 mA y la potencia que entrega la fuente I_S.



Para el circuito de la figura determine la corriente i_0 y la potencia que entrega la fuente de 240 V.