1.

49. Find the Thévenin equivalent of the two-terminal network shown in Fig. 5.91.

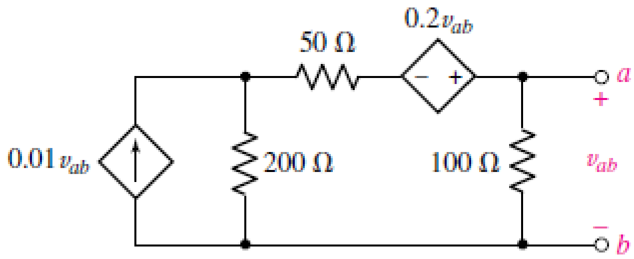


FIGURE 5.91

2.

50. Find the Thévenin equivalent of the circuit in Fig. 5.92.

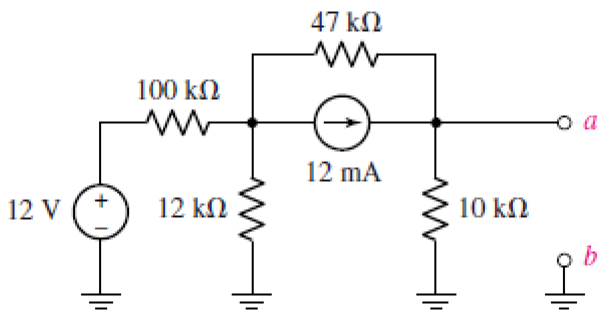


FIGURE 5.92

3.

56. Find the Thévenin equivalent resistance seen by the 2 kΩ resistor in the circuit of Fig. 5.98. Ignore the dashed line in the figure.

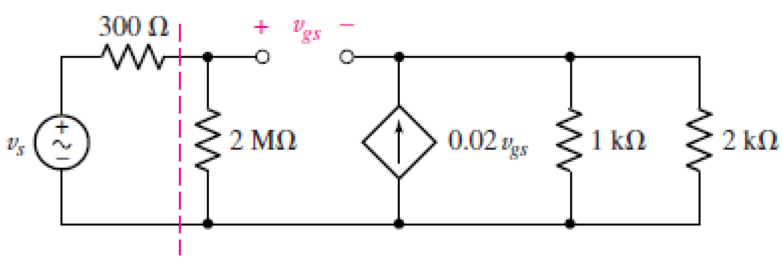


FIGURE 5.98

4.

64. With reference to the circuit of Fig. 5.104: (*a*) determine that value of R_L to which a maximum power can be delivered, and (*b*) calculate the voltage across R_L then (+ reference at top).

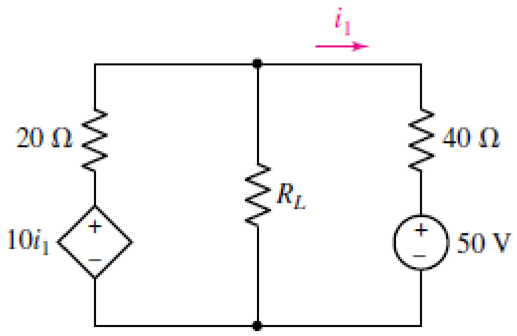


FIGURE 5.104

5.

73. Use Y-Δ and Δ-Y transformations to find the input resistance of the network shown in Fig. 5.110.

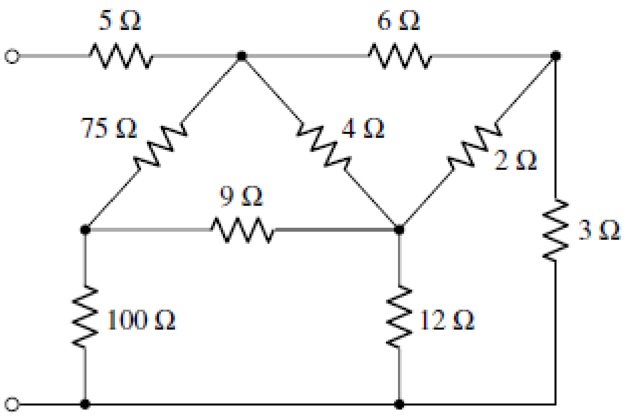


FIGURE 5.110

6.

83. A DMM is connected to a resistor circuit as shown in Fig. 5.120. If the input resistance of the DMM is 1 MΩ, what value will be displayed if the DMM is measuring resistance?

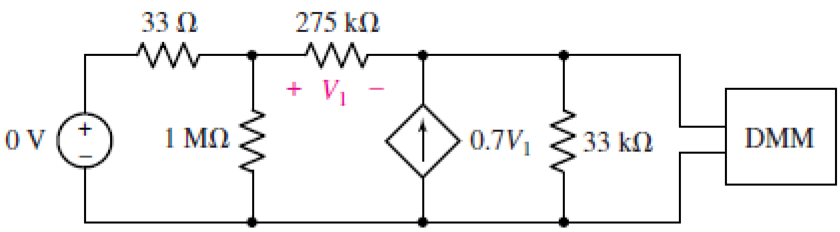


FIGURE 5.120

7.

28. Compute v_x for the multiple op amp circuit of Fig. 6.59.

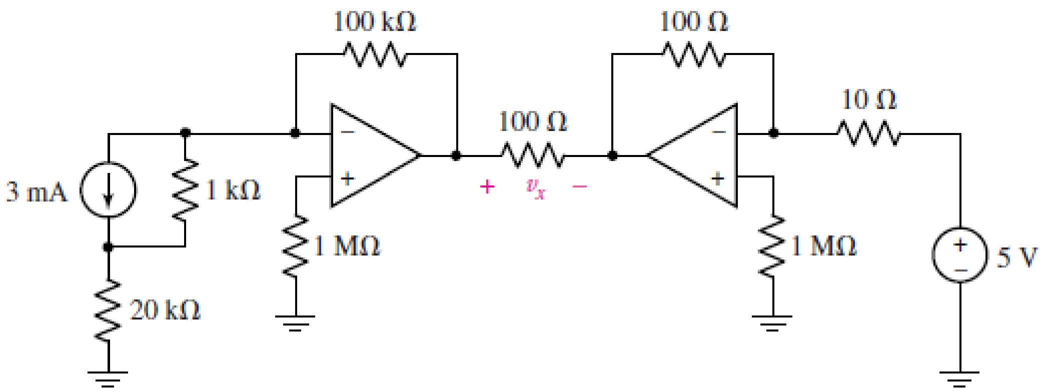


FIGURE 6.59

8.

39. For the cascaded op amp circuit shown in Fig. 6.63, compute the output voltage of each stage.

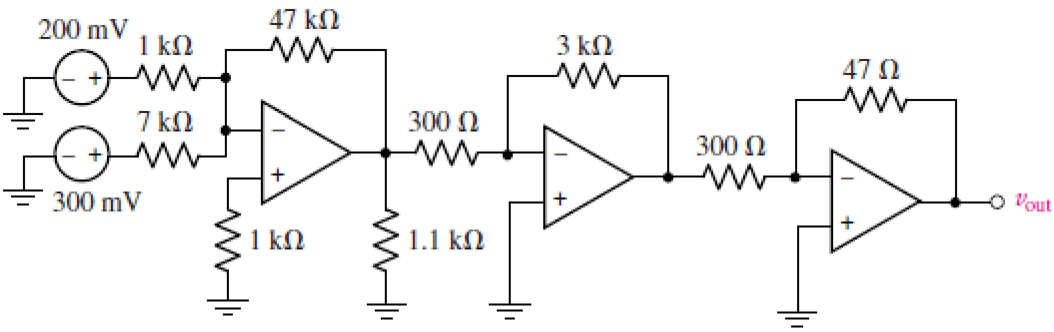
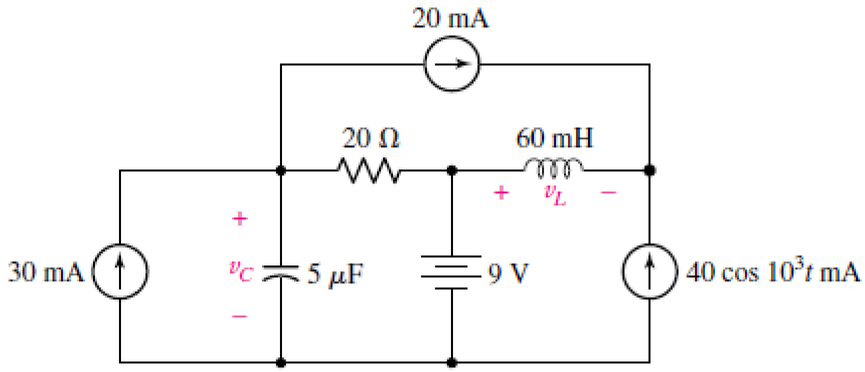


FIGURE 6.63

9.

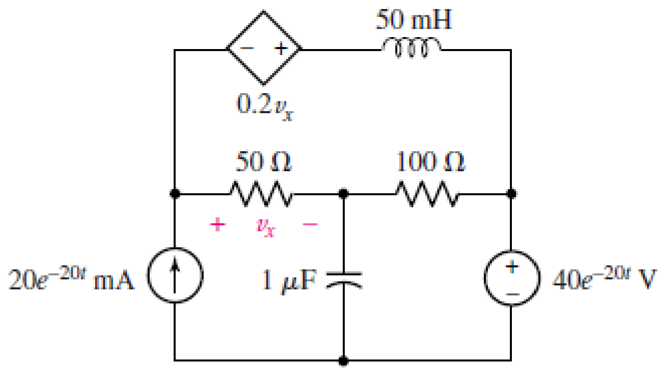
49. If it is assumed that all the sources in the circuit of Fig. 7.70 have been connected and operating for a very long time, use the superposition principle to find $v_C(t)$ and $v_L(t)$.



■ FIGURE 7.70

10.

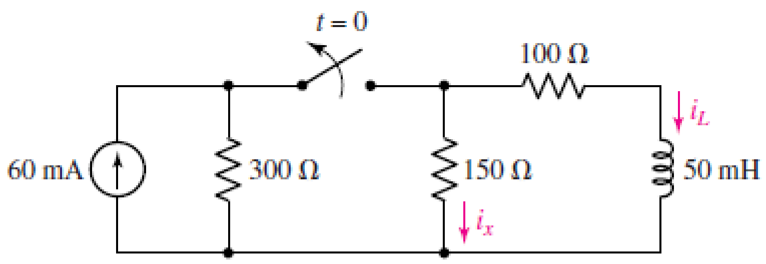
50. For the circuit of Fig. 7.71, assume no energy is stored at $t = 0$, and write a complete set of nodal equations.



■ FIGURE 7.71

11.

26. The switch in Fig. 8.66 opens at $t = 0$ after having been closed for an interminably long time. Find i_L and i_x at (*a*) $t = 0^-$; (*b*) $t = 0^+$; (*c*) $t = 300$ μs.



■ FIGURE 8.66

12.

30. Select values for R_1 and R_2 in the circuit of Fig. 8.68 so that $v_R(0^+) = 10$ V and $v_R(1\text{ ms}) = 5$ V.

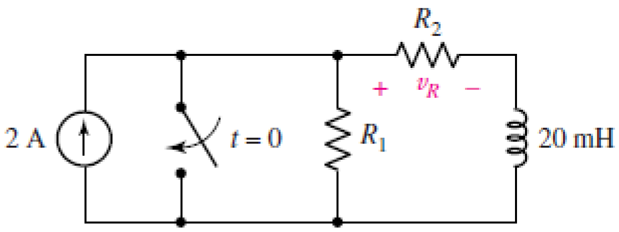


FIGURE 8.68

13.

37. After being in the configuration shown for a long time, the switch in Fig. 8.74 is opened at $t = 0$. Determine values for (*a*) $i_s(0^-)$; (*b*) $i_x(0^-)$; (*c*) $i_x(0^+)$; (*d*) $i_s(0^+)$; (*e*) $i_x(0.4\text{ s})$.

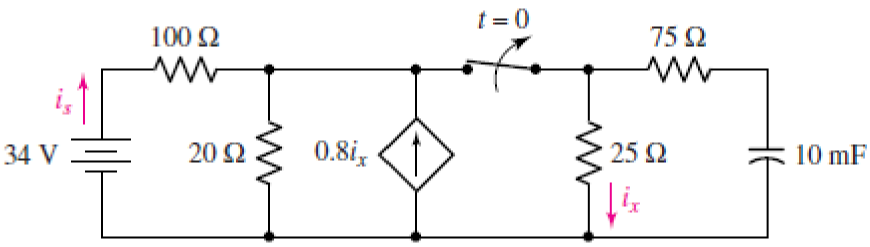


FIGURE 8.74

14.

44. Find $i_1(t)$ for $t < 0$ and $t > 0$ in the circuit of Fig. 8.81.

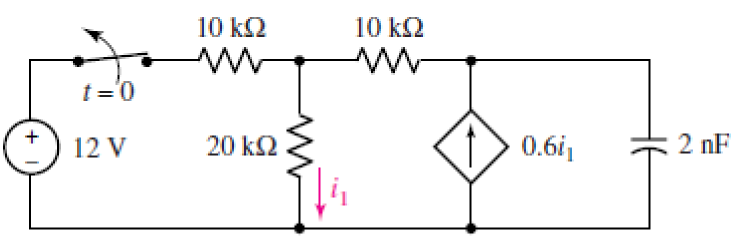


FIGURE 8.81

15.

57. Find i_x in the circuit of Fig. 8.90 at 1 s intervals from $t = -0.5$ s to $t = 3.5$ s.

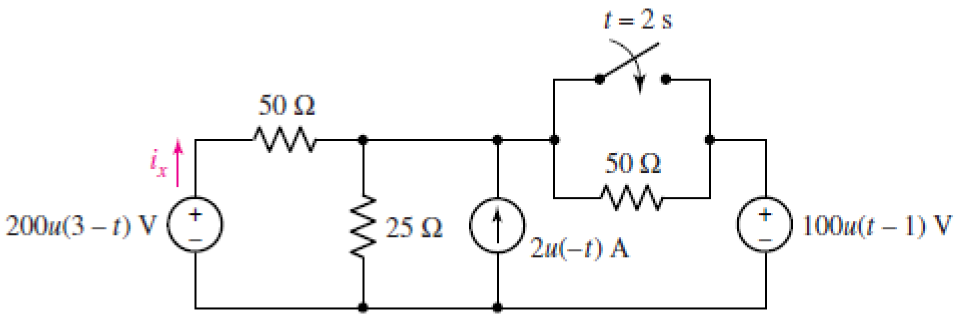


FIGURE 8.90

16.

68. The switch shown in Fig. 8.100 has been closed for a long time. (*a*) Find i_L for $t < 0$. (*b*) Find $i_L(t)$ for all t after the switch opens at $t = 0$.

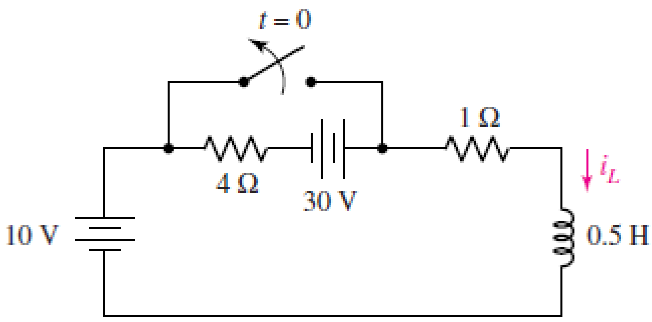


FIGURE 8.100

17.

79. Find an expression for $v(t)$ in the circuit of Fig. 8.109 valid for all time.

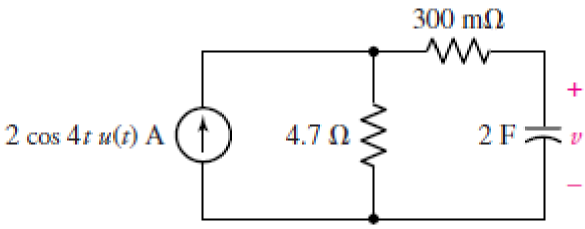
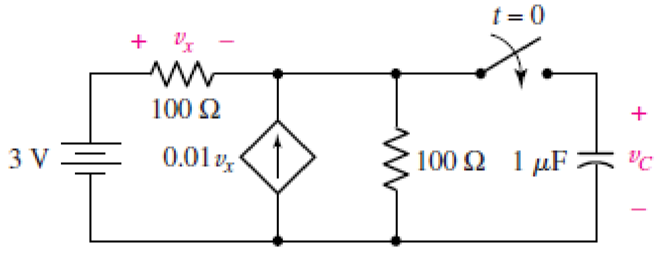


FIGURE 8.109

18.

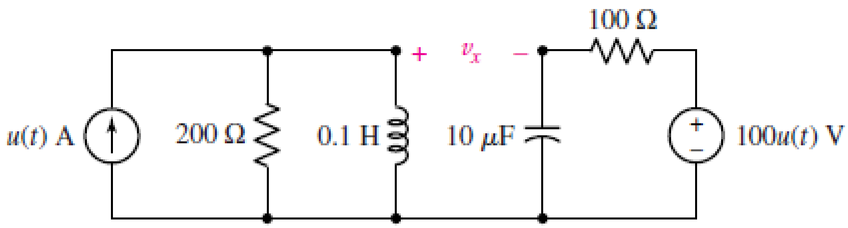
86. Find v_C for $t > 0$ in the circuit of Fig. 8.115.



■ **FIGURE 8.115**

19.

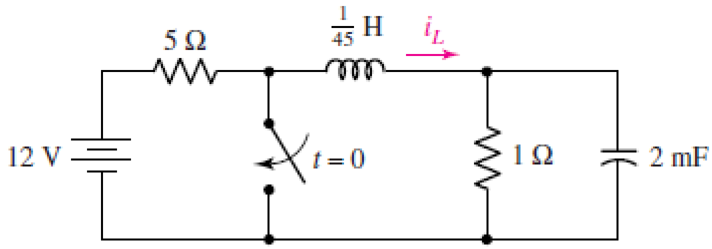
91. Find the first instant of time after $t = 0$ at which $v_x = 0$ in the circuit of Fig. 8.120.



■ **FIGURE 8.120**

20.

17. Find $i_L(t)$ for $t \geq 0$ in the circuit shown in Fig. 9.41.



■ **FIGURE 9.41**

21.

22. The switch in Fig. 9.45 was closed by the last crew aboard Mir before (at $t = 0$) it returned to earth. (*a*) Find $i_A(0^-)$. (*b*) Find $i_A(0^+)$. (*c*) Find $v_C(0^-)$. (*d*) Find the equivalent resistance in parallel with L and C for $t > 0$. (*e*) Find $i_A(t)$.

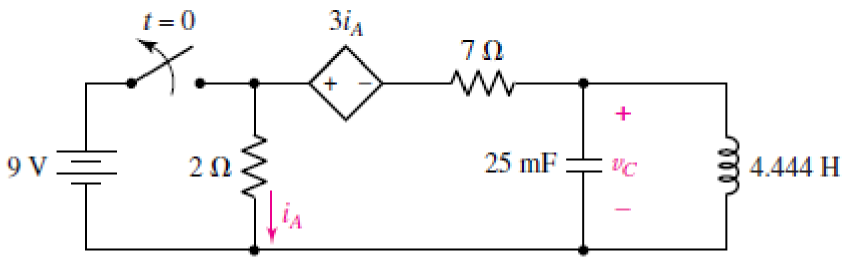


FIGURE 9.45

22.

33. Find $i_C(t)$ for $t > 0$ in the circuit shown in Fig. 9.47.

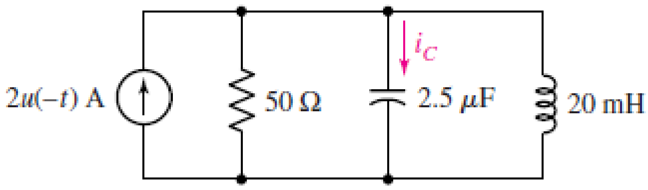


FIGURE 9.47

23.

43. Find $i_L(t)$ for $t > 0$ in the circuit of Fig. 9.53.

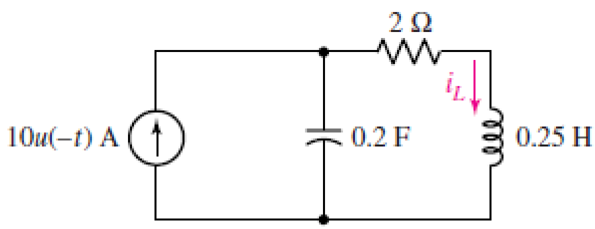
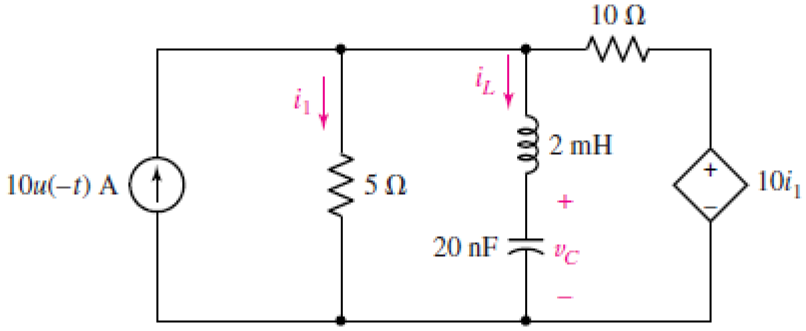


FIGURE 9.53

24.

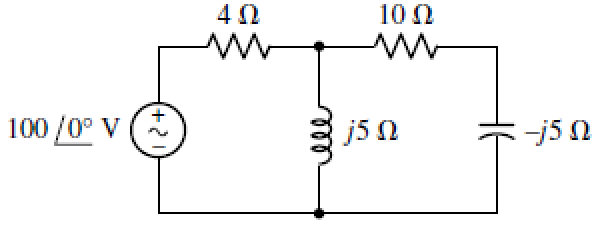
52. Find an expression for i_L as indicated in Fig. 9.58, valid for $t > 0$.



■ **FIGURE 9.58**

25.

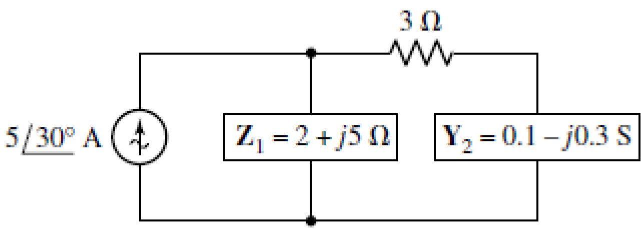
11. Find the average power being absorbed by each of the five circuit elements shown in Fig. 11.29.



■ **FIGURE 11.29**

26.

13. In the circuit shown in Fig. 11.31, find the average power being (*a*) dissipated in the 3 Ω resistor; (*b*) generated by the source.



■ **FIGURE 11.31**

27.

29. Determine the effective value of the waveform depicted in Fig. 11.42.

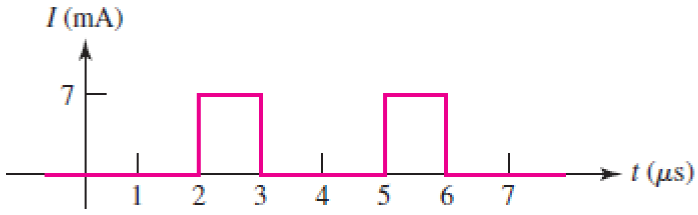


FIGURE 11.42

28.

19. Find the average power supplied by the dependent source of Fig. 11.35.

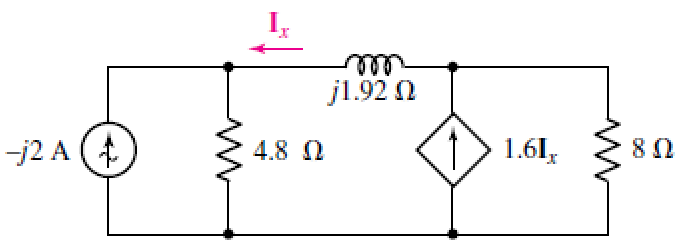


FIGURE 11.35

29.

32. Find the effective value of (*a*) $g(t) = 2 + 3\cos 100t + 4\cos(100t - 120°)$; (*b*) $h(t) = 2 + 3\cos 100t + 4\cos(101t - 120°)$; (*c*) the waveform of Fig. 11.44.

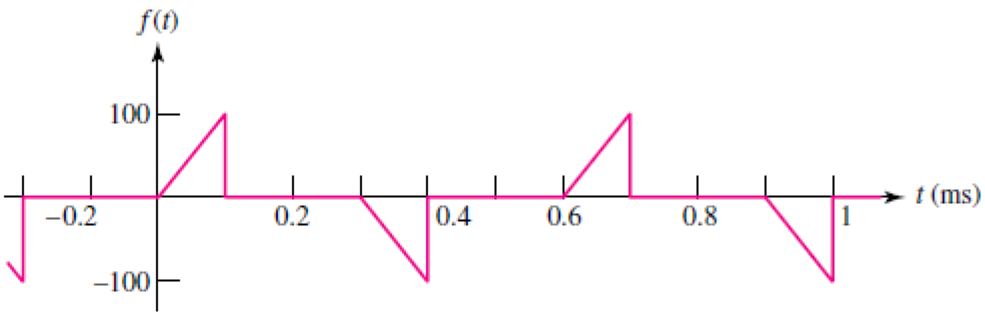


FIGURE 11.44

30.

41. In Fig. 11.47, let $\mathbf{I} = 4\underline{/35^\circ}$ A rms, and find the average power being supplied: (*a*) by the source; (*b*) to the 20 Ω resistor; (*c*) to the load. Find the apparent power being supplied: (*d*) by the source; (*e*) to the 20 Ω resistor; (*f*) to the load. (*g*) What is the load PF?

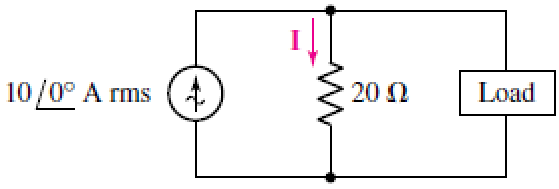


FIGURE 11.47

31.

10. The 230/460 V rms 60 Hz three-wire system shown in Fig. 12.29 supplies power to three loads: load *AN* draws a complex power of $10\underline{/40^\circ}$ kVA, load *NB* uses $8\underline{/10^\circ}$ kVA, and load *AB* requires $4\underline{/-80^\circ}$ kVA. Find the two line currents and the neutral current.

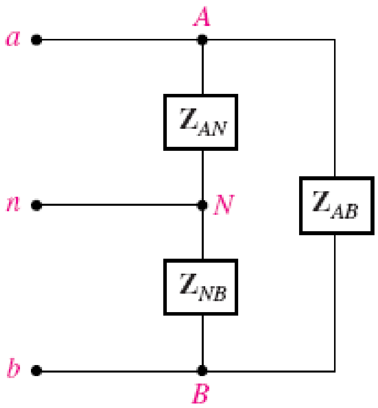
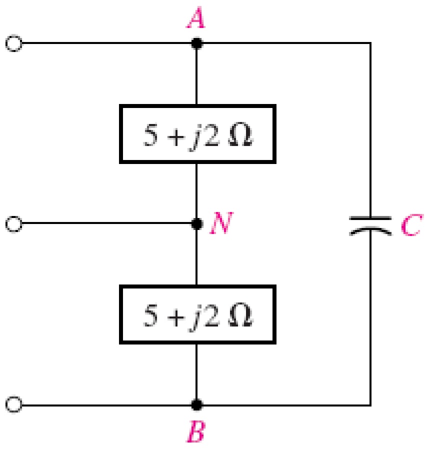


FIGURE 12.29

32.

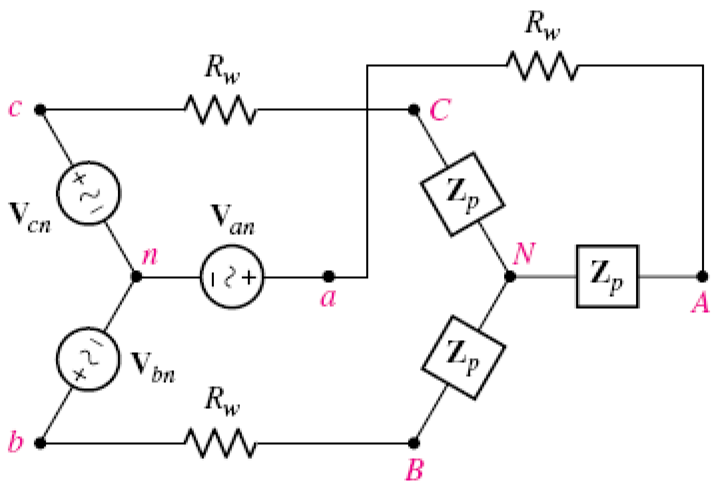
13. In the balanced three-wire single-phase system of Fig. 12.30, let $V_{AN} = 220$ V at 60 Hz. (*a*) What size should *C* be to provide a unity-power-factor load? (*b*) How many kVA does *C* handle?



■ **FIGURE 12.30**

33.

15. Figure 12.31 shows a balanced three-phase three-wire system with positive phase sequence. Let $\mathbf{V}_{BC} = 120\underline{/60^\circ}$ V and $R_w = 0.6\ \Omega$. If the total load (including wire resistance) draws 5 kVA at PF = 0.8 lagging, find (*a*) the total power lost in the line resistance, and (*b*) $\mathbf{V}_{an}$.



■ **FIGURE 12.31**

34.

25. Figure 12.32 shows a balanced three-wire three-phase circuit. Let $R_w = 0$ and $\mathbf{V}_{an} = 200\underline{/60^\circ}$ V. Each phase of the load absorbs a complex power, $\mathbf{S}_p = 2 - j1$ kVA. If (+) phase sequence is assumed, find: (*a*) $\mathbf{V}_{bc}$; (b) $\mathbf{Z}_p$; (*c*) $\mathbf{I}_{aA}$.

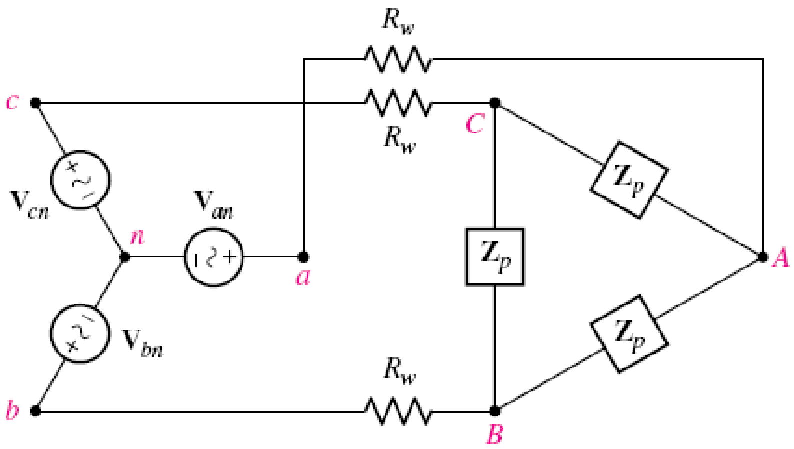


FIGURE 12.32

35.

29. The source in Fig. 12.33 is balanced and exhibits (+) phase sequence. Find (*a*) $\mathbf{I}_{aA}$; (*b*) $\mathbf{I}_{bB}$; (*c*) $\mathbf{I}_{cC}$; (*d*) the total complex power supplied by the source.

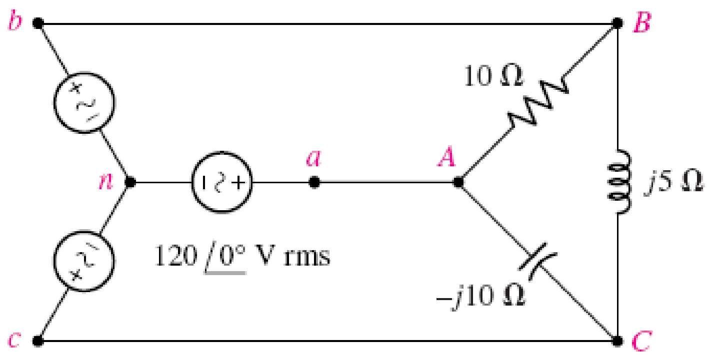


FIGURE 12.33