## Practice Problem 2.10

Find $R_{ab}$ for the circuit in Fig. 2.39.

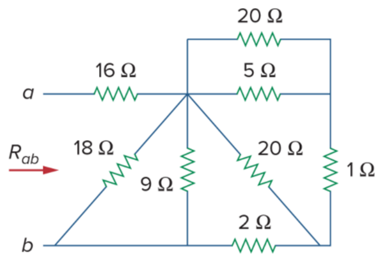


Figure 2.39
For Practice Prob. 2.10.

**Answer:** 19 Ω.

## Practice Problem 2.11

Calculate $G_{eq}$ in the circuit of Fig. 2.41.

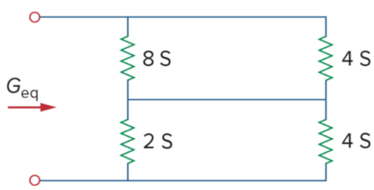


Figure 2.41
For Practice Prob. 2.11.

**Answer:** 4 S.

Note: G is called conductance, which is the reciprocal of resistance, i.e., G = 1/R. The unit "S" is called Siemens, which is the unit of conductance and therefore S = 1/Ω.

## Practice Problem 2.12

Find $v_1$ and $v_2$ in the circuit shown in Fig. 2.43. Also calculate $i_1$ and $i_2$ and the power dissipated in the 12-Ω and 40-Ω resistors.

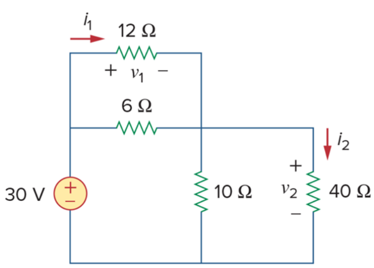


Figure 2.43
For Practice Prob. 2.12.

**Answer:** $v_1 = 10$ V, $i_1 = 833.3$ mA, $p_1 = 8.333$ W, $v_2 = 20$ V, $i_2 = 500$ mA, $p_2 = 10$ W.

## Practice Problem 3.3

Find $v$ and $i$ in the circuit of Fig. 3.11.

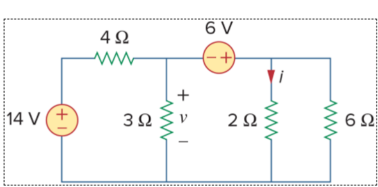


Figure 3.11
For Practice Prob. 3.3.

**Answer:** −400 mV, 2.8 A.

## Practice Problem 3.5

Calculate the mesh currents $i_1$ and $i_2$ of the circuit of Fig. 3.19.

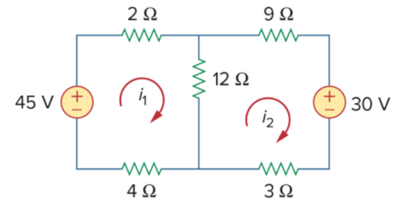


Figure 3.19
For Practice Prob. 3.5.

**Answer:** $i_1 = 2.5$ A, $i_2 = 0$ A.

## Practice Problem 3.7

Use mesh analysis to determine $i_1$, $i_2$, and $i_3$ in Fig. 3.25.

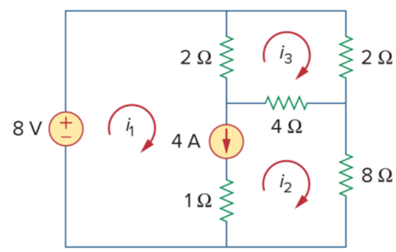


Figure 3.25
For Practice Prob. 3.7.

**Answer:** $i_1 = 4.632$ A, $i_2 = 631.6$ mA, $i_3 = 1.4736$ A.

## Practice Problem 3.8

By inspection, obtain the node-voltage equations for the circuit in Fig. 3.28.

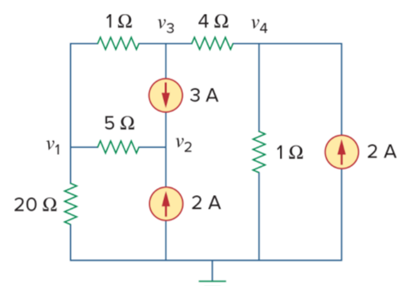


Figure 3.28
For Practice Prob. 3.8.

**Answer:**

$$\begin{bmatrix} 1.25 & -0.2 & -1 & 0 \\ -0.2 & 0.2 & 0 & 0 \\ -1 & 0 & 1.25 & -0.25 \\ 0 & 0 & -0.25 & 1.25 \end{bmatrix} \begin{bmatrix} v_1 \\ v_2 \\ v_3 \\ v_4 \end{bmatrix} = \begin{bmatrix} 0 \\ 5 \\ -3 \\ 2 \end{bmatrix}$$

## Practice Problem 3.9

By inspection, obtain the mesh-current equations for the circuit in Fig. 3.30.

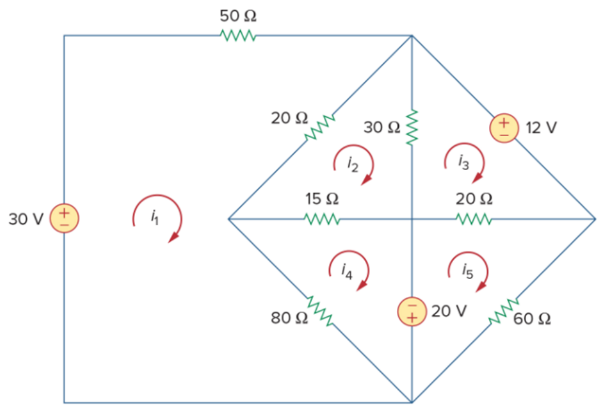


Figure 3.30
For Practice Prob. 3.9.

**Answer:**

$$\begin{bmatrix} 150 & -20 & 0 & -80 & 0 \\ -20 & 65 & -30 & -15 & 0 \\ -0 & -30 & 50 & 0 & -20 \\ 80 & -15 & 0 & 95 & 0 \\ 0 & 0 & -20 & 0 & 80 \end{bmatrix} \begin{bmatrix} i_1 \\ i_2 \\ i_3 \\ i_4 \\ i_5 \end{bmatrix} = \begin{bmatrix} 30 \\ 0 \\ -12 \\ 20 \\ -20 \end{bmatrix}$$

## Practice Problem 4.3

Using the superposition theorem, find $v_o$ in the circuit of Fig. 4.8.

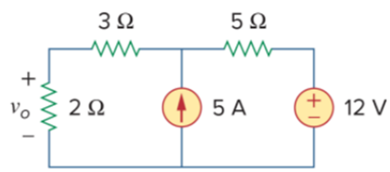


Figure 4.8
For Practice Prob. 4.3.

**Answer:** 7.4 V.

## Practice Problem 4.5

Find $I$ in the circuit of Fig. 4.14 using the superposition principle.

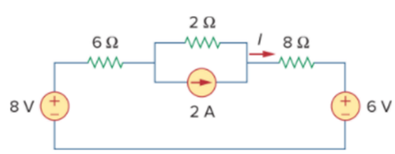


Figure 4.14
For Practice Prob. 4.5.

**Answer:** 375 mA.

## Practice Problem 4.8

Using Thevenin's theorem, find the equivalent circuit to the left of the terminals in the circuit of Fig. 4.30. Then find $I$.

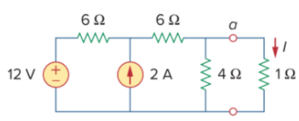


Figure 4.30
For Practice Prob. 4.8.

**Answer:** $V_{Th} = 6$ V, $R_{Th} = 3\ \Omega$, $I = 1.5$ A.

## Practice Problem 4.11

Find the Norton equivalent circuit for the circuit in Fig. 4.42, at terminals *a*-*b*.

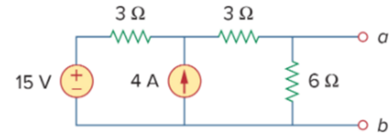


Figure 4.42
For Practice Prob. 4.11.

**Answer:** $R_N = 3\ \Omega$, $I_N = 4.5$ A.

## Practice Problem 4.16

The measured open-circuit voltage across a certain amplifier is 9 V. The voltage drops to 8 V when a 20-Ω loudspeaker is connected to the amplifier. Calculate the voltage when a 10-Ω loudspeaker is used instead.

**Answer:** 7.2 V.