1.21 For the circuit shown in Fig. P1.19, suppose that $i_2 = -2$ A. Use the current-divider formula to determine i_1, i_3, i_4, and i_5.

1.22 For the circuit given in Fig. P1.19, suppose that $i_5 = 4$ A. Use the current-divider formula to determine i_1, i_2, i_3, and i_4.

1.23 For the circuit shown in Fig. P1.23, suppose that $i_1 = 2$ A. Find v for the case that (a) $i_2 = 1$ A, (b) $i_2 = 2$ A, and (c) $i_2 = 3$ A.

1.24 Consider the circuit shown in Fig. P1.23. Find v when (a) $i_1 = 12$ A and $i_2 = 6$ A, (b) $i_1 = 6$ A and $i_2 = 6$ A, (c) $i_1 = 6$ A and $i_2 = 12$ A.

1.25 Find the variables indicated for the circuits shown in Fig. P1.25.

1.26 Find the variables indicated for the circuits shown in Fig. P1.26. (See p. 48.)

1.27 Find the variables indicated for the circuits shown in Fig. P1.27. (See p. 48.)

1.28 For the circuit shown in Fig. P1.28, find the variables indicated when R is (a) 2 Ω, (b) 4 Ω, and (c) 6 Ω.

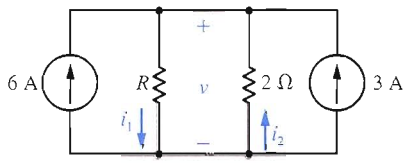


Fig. P1.28

1.29 For the circuit shown in Fig. P1.29, find the variables indicated when R is (a) 2 Ω, (b) 4 Ω, and (c) 6 Ω.

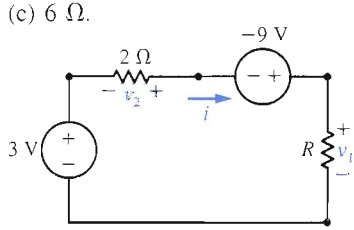


Fig. P1.29

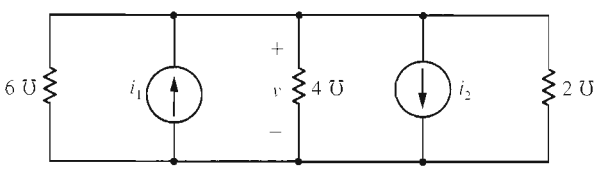
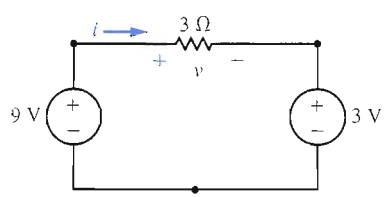
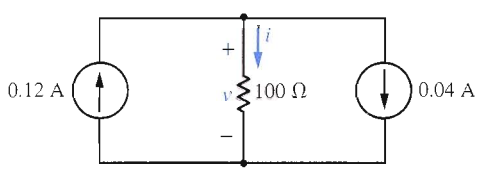


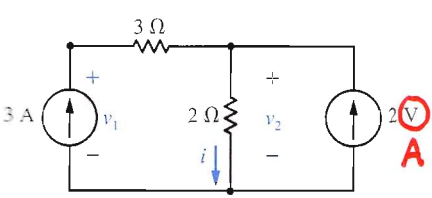
Fig. P1.23



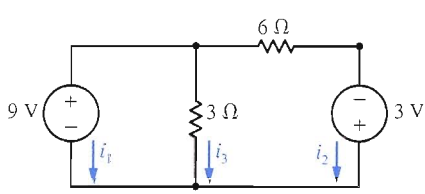
(a)



(b)



(c)



(d)

Fig. P1.25 *a-d*

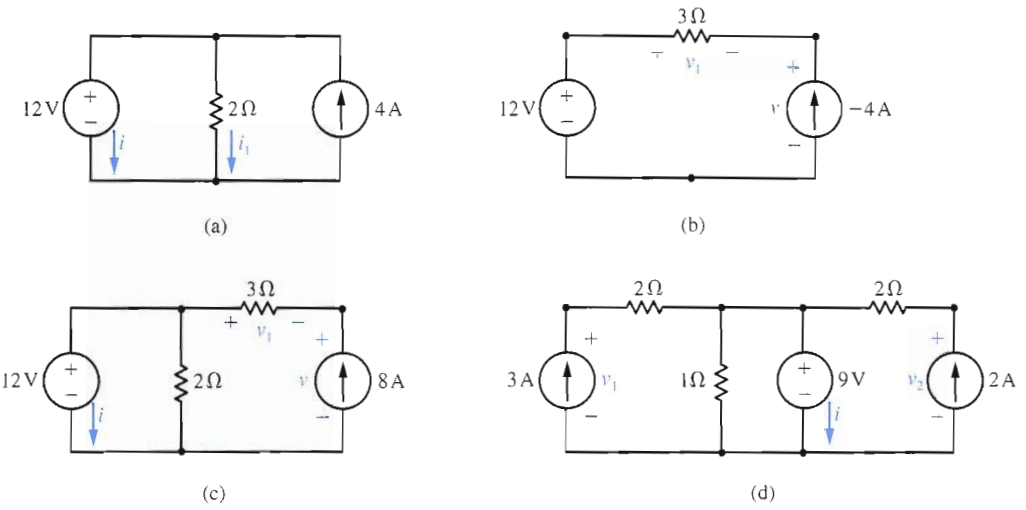


Fig. P1.26 *a-d*

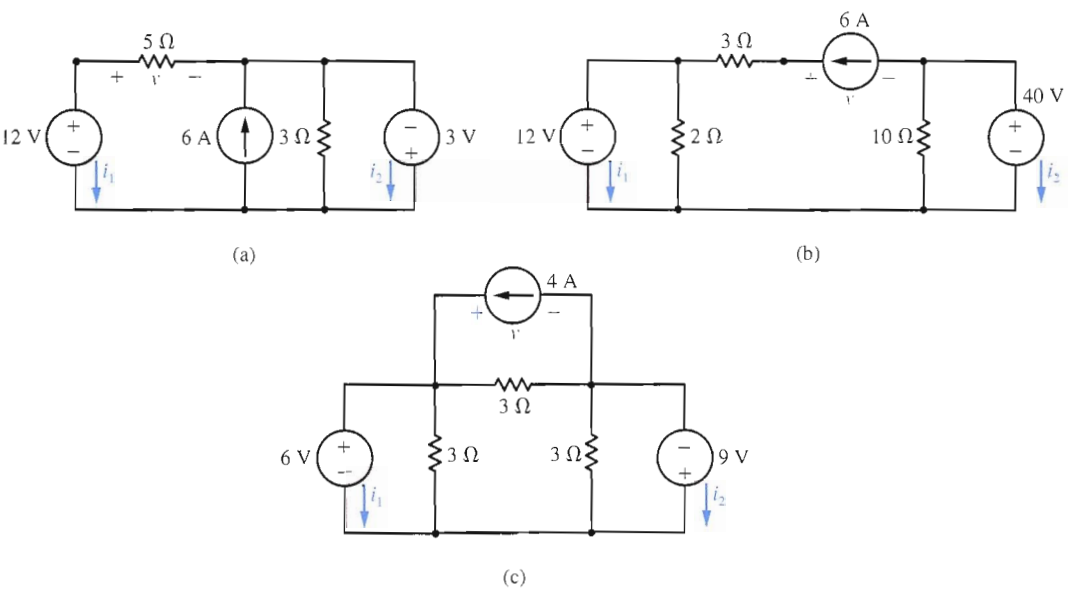


Fig. P1.27 *a-c*

1.30 Find v and i for the series-parallel circuit shown in Fig. P1.30.

1.31 Find v and i for the series-parallel circuit shown in Fig. P1.31.

1.32 Consider the circuit shown in Fig. P1.32. (a) Find i, v_1, v_2, and v_3. (b) Remove the short circuit between a and b (erase it), and find i, v_1, and v_2. (Don't try to find v_3—it can't be done!)

1.33 Consider the series-parallel circuit shown in Fig. P1.33. (a) Find V_s when $v_1 = 2$ V. (b) Find V_s when $i_3 = 3$ A. (c) Find V_s when $i_5 = 4$ A. (d) What is the resistance $R_{eq} = V_s/i$ loading the battery for part (a)? For part (b)? For part (c)?