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) \( 2 \) \( \Omega \), (b) \( 4 \) \( \Omega \), and (c) \( 6 \) \( \Omega \).

1.29 For the circuit shown in Fig. P1.29, find the variables indicated when \( R \) is (a) \( 2 \) \( \Omega \), (b) \( 4 \) \( \Omega \), and (c) \( 6 \) \( \Omega \).
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 $V_1$ when $v_1 = 2$ V. (b) Find $V_1$ when $i_2 = 3$ A. (c) Find $V_2$ when $i_4 = 4$ A. (d) What is the resistance $R_{eq} = V_2/i$? Is it the resistance for part (a)? For part (b)? For part (c)?