is **balanced**. Under what condition (find an expression relating R_1 and R_2) will this bridge be balanced?

1.42 For the circuit shown in Fig. P1.42, find i_1 when (a) $K = 2$, (b) $K = 3$, and (c) $K = 4$.

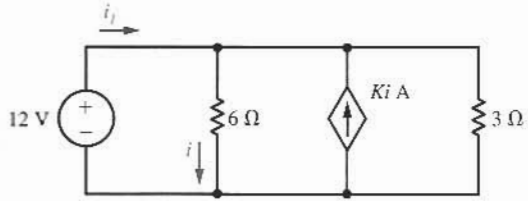

Fig. P1.42

1.43 The circuit shown in Fig. P1.43 contains a **voltage-dependent voltage source** as well as a current-dependent current source. Find i_1 when (a) $K = -3$, (b) $K = -1.5$, and (c) $K = 1.5$.

1.44 Consider the circuit shown in Fig. P1.44. Find v when (a) $K = 2$, and (b) $K = 4$.

1.45 Consider the circuit shown in Fig. P1.45. Find i when (a) $K = 2$, and (b) $K = 4$.

1.46 Consider the circuit shown in Fig. P1.46. (a) Find the resistance $R_{eq} = v_1/i_1$. (b) Find the voltage v_2 in terms of the applied voltage v_1.

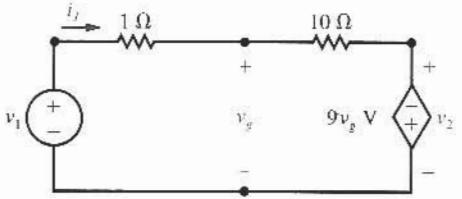

Fig. P1.46

1.47 Consider the circuit shown in Fig. P1.47. (a) Find the resistance $R_{eq} = v_1/i_1$. (b) Use voltage division to find v in terms of v_g. (c) Find the voltage v_2 in terms of the applied voltage v_1.

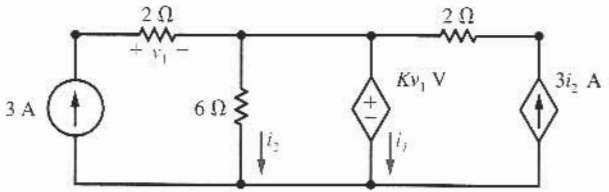

Fig. P1.43

Problems

2.1 For the circuit shown in Fig. P2.1, select node d as the reference node. (a) Use nodal analysis to find the node voltages. (b) Use the node voltages to determine i_1, i_2, i_3, and i_4.

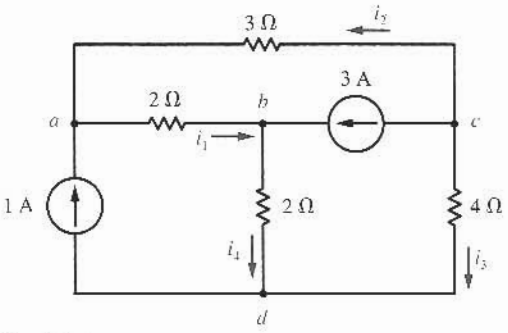

Fig. P2.1

2.2 For the circuit shown in Fig. P2.1, select node c as the reference node. (a) Use nodal analysis to find the node voltages. (b) Use the node voltages to determine i_1, i_2, i_3, and i_4.

2.3 For the circuit shown in Fig. P2.1, select node b as the reference node. (a) Use nodal analysis to find the node voltages. (b) Use the node voltages to determine i_1, i_2, i_3, and i_4.

2.4 For the circuit shown in Fig. P2.1, select node a as the reference node. (a) Use nodal analysis to find the node voltages. (b) Use the node voltages to determine i_1, i_2, i_3, and i_4.

2.5 Find the node voltages for the circuit shown in Fig. P2.5.

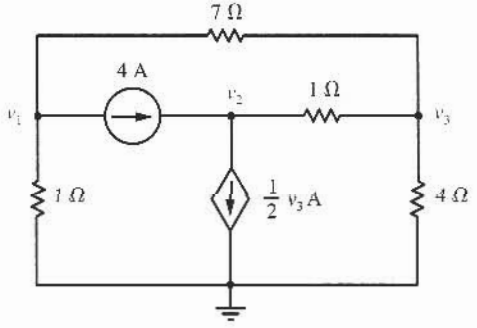

Fig. P2.5

2.6 Find the node voltages for the circuit shown in Fig. P2.6.

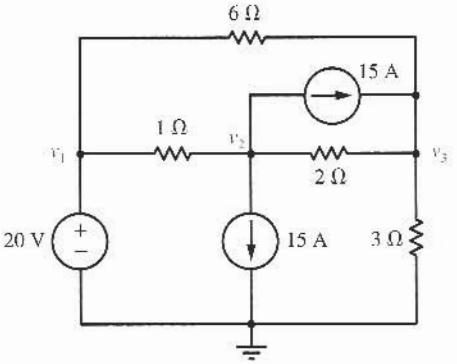

Fig. P2.6

2.7 Find the node voltages for the circuit shown in Fig. P2.7. (See p. 100.)

2.8 Find the node voltages for the circuit shown in Fig. P2.8.

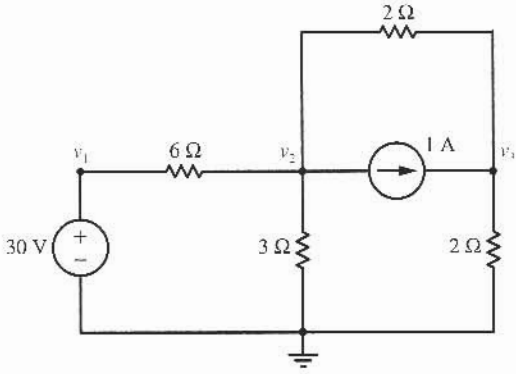

Fig. P2.8

2.9 Find the node voltages for the circuit shown in Fig. P2.9.

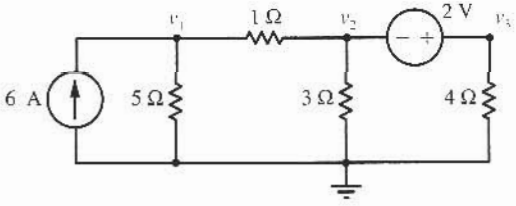

Fig. P2.9

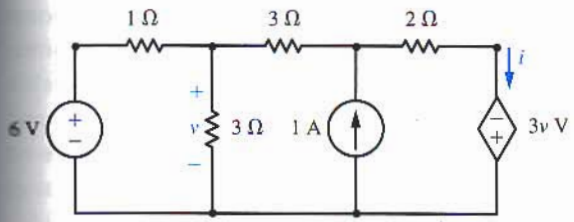

Fig. P2.60

2.60 Consider the circuit shown in Fig. P2.60. (a) Find the portion of i and the portion of v that are due to the 6-V voltage source. (b) Find the portion of i and the portion of v that are due to the 1-A current source. (c) Find i and v.

2.61 Consider the circuit shown in Fig. P2.61. (a) Find the portion of i and the portion of v that are due to the 2-A current source. (b) Find the portion of i and the portion of v that are due to the 6-V voltage source. (c) Find the portion of i and the portion of v that are due to the 4-V voltage source. (d) Find i and v.

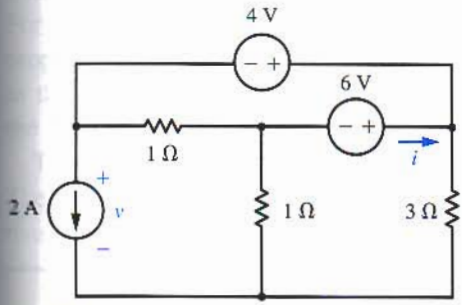

Fig. P2.61

2.62 Consider the circuit shown in Fig. P2.62. (a) Find the portion of i and the portion of v that are due to the 12-V voltage source. (b) Find the portion of i and the portion of v that are due to the 6-V voltage source. (c) Find the portion of i and the portion of v that are due to the 6-A current source. (d) Find i and v.

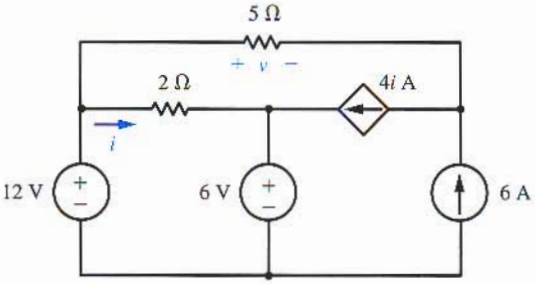

Fig. P2.62