## **Problems**

An ideal voltage source is described by the motion  $v(t) = 10e^{-t}$  V. Find the value of this voltage source when (a) t = 0 s, (b) t = 1 s, (c) t = 2 (d) t = 3 s, (e) t = 4 s.

An ideal voltage source is described by the motion  $v(t) = 5 \sin (\pi/2)t$  V. Find the value of this source when (a) t = 0 s, (b) t = 1 s, t = 2 s, (d) t = 3 s, and (e) t = 4 s.

An ideal voltage source is described by the function  $v(t) = 3 \cos(\pi/2)t$  V. Find the value of this source when (a) t = 0 s, (b) t = 1 s, (c) t = 2 s, (d) t = 3 s, and (e) t = 4 s.

**1.4** Find the current in a region when the total charge in the region is described by the function (a)  $q(t) = 4e^{-2t}$  C, (b)  $q(t) = 3 \sin \pi t$  C, (c)  $q(t) = 6 \cos 2\pi t$  C, and (d)  $q(t) = 5e^{-4t} \cos 3t$  C.

**1.5** An ideal voltage source is described by the function shown in Fig. P1.5. Find the value of this voltage source when (a) t = 0 s, (b) t = 1 s, (c) t = 2 s, (d) t = 3 s, and (e) t = 4 s.

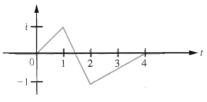


Fig. P1.5

**1.6** The total charge q(t) in some region is described by the function shown in Fig. P1.5. Sketch the current i(t) in this region.

**1.7** Consider the circuit shown in Fig. P1.7. (a) Given  $i_1 = 4$  A, find  $v_1$ . (b) Given  $i_2 = -2$  A, find  $v_2$ . (c) Given  $i_3 = 2$  A, find  $v_3$ . (d) Given  $i_4 = -2$  A, find  $v_4$ .

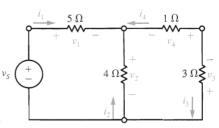


Fig. P1.7

**1.8** Consider the circuit in Fig. P1.7. (a) Given  $v_1 = 30$  V, find  $i_1$ . (b) Given  $v_2 = 12$  V, find  $i_2$ . (c) Given  $v_3 = -9$  V, find  $i_3$ . (d) Given  $v_4 = -3$  V, find  $i_4$ .

**1.9** Consider the circuit shown in Fig. P1.7. (a) Given  $v_1 = -10$  V, find  $i_1$ . (b) Given  $i_2 = 1$  A, find  $v_2$ . (c) Given  $v_3 = 3$  V, find  $i_3$ . (d) Given  $i_4 = 1$  A, find  $v_4$ .

**1.10** Consider the circuit in Fig. P1.10. (a) Given  $v_1 = -6$  V, find  $i_1$ . (b) Given  $v_2 = 24$  V, find  $i_2$ . (c) Given  $v_3 = 11$  V, find  $i_3$ . (d) Given  $v_4 = 21$  V, find  $i_4$ . (e) Given  $v_5 = -14$  V, find  $i_5$ .

**1.11** Consider the circuit shown in Fig. P1.10. (a) Given  $i_1 = 1.5$  A, find  $v_1$ . (b) Given  $i_2 = -4$  A, find  $v_2$ . (c) Given  $i_3 = 5.5$  A, find  $v_3$ . (d) Given  $i_4 = 3.5$  A, find  $v_4$ . (e) Given  $i_5 = 3.5$  A, find  $v_5$ .

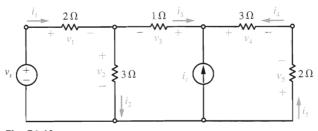


Fig. P1.10