Question 0

Find the relationship between dc supply power and ac supply power, by using the setup shown below:
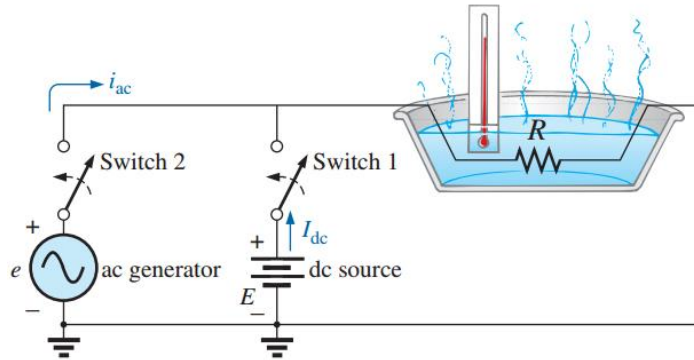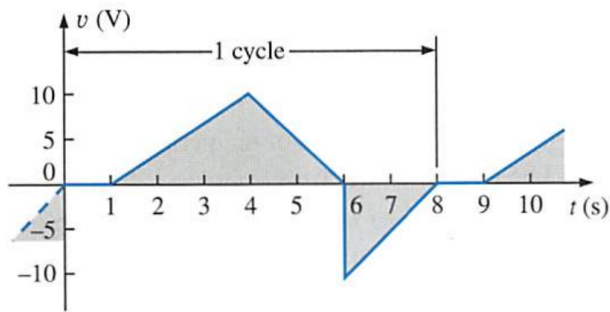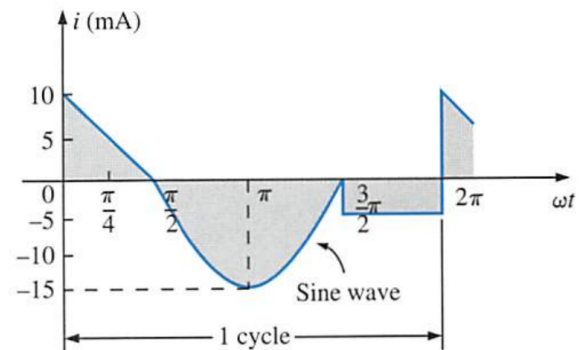

FIG. 13.59
An experimental setup to establish a relationship between dc and ac quantities.

Question 1 (13-39)

39. Find the average value of the periodic waveforms of Fig. 13.92 over one full cycle.

(a)

(b)

FIG. 13.92
Problem 39.

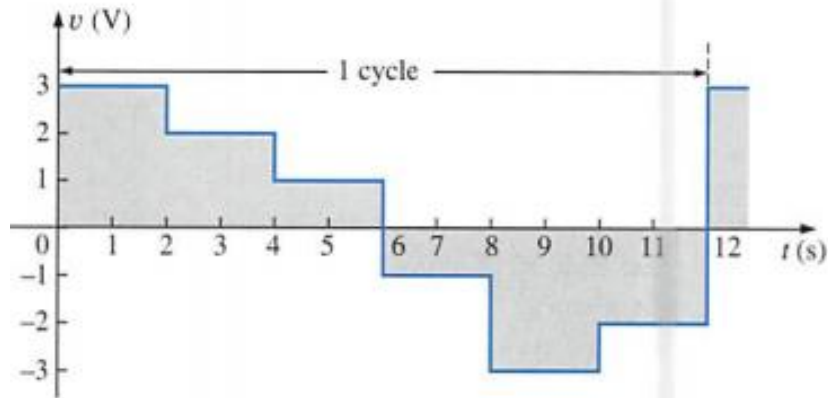**45.** Find the effective value of the periodic waveform of Fig. 13.96 over one full cycle.

FIG. 13.96
Problem 45.

35. In Fig. 14.75, $e = 100 \sin(157t + 30°)$.
   a. Find the sinusoidal expression for i.
   b. Find the value of the inductance L.
   c. Find the average power loss by the inductor.
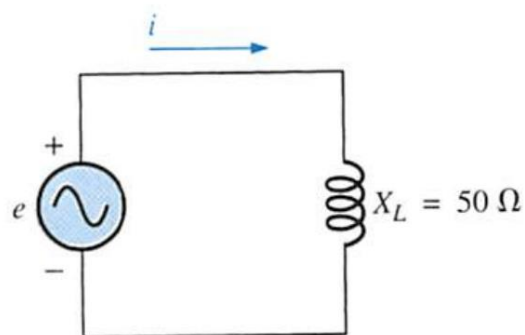
FIG. 14.75

47. a. Determine a solution for x and y if

$$(x + j4) + (3x + jy) - j7 = 16 \angle 0°$$

b. Determine x if

$$(10 \angle 20°)(x \angle -60°) = 30.64 - j25.72$$

c. Determine a solution for x and y if

$$(5x + j10)(2 - jy) = 90 - j70$$

d. Determine θ if

$$\frac{80 \angle 0°}{20 \angle \theta} = 3.464 - j2$$

Question 5 (14-52)

52. Find the sinusoidal expression for the applied voltage e for the system of Fig. 14.81 if

$$v_a = 60 \sin(\omega t + 30°)$$
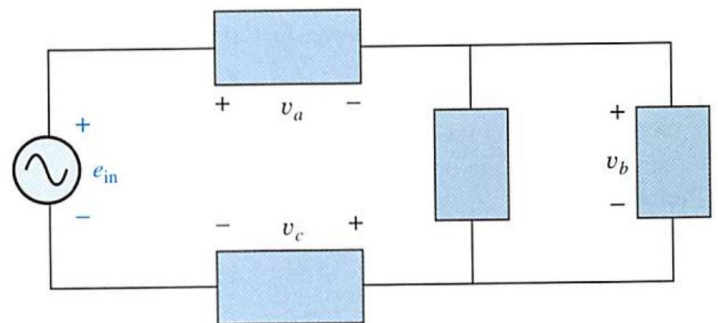$$v_b = 30 \sin(\omega t - 30°)$$
$$v_c = 40 \sin(\omega t + 120°)$$

FIG. 14.81
Problem 52.