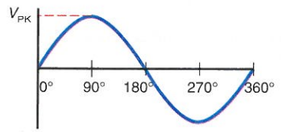
Figure 15–29



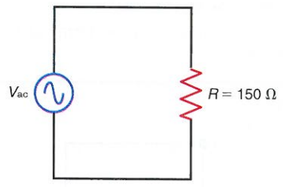
15–11 If the sine wave in Fig. 15–29 has a peak value of 50 V, then calculate
- a. the peak-to-peak value.
- b. the rms value.
- c. the average value.

15–12 If the sine wave in Fig. 15–29 has an rms value of 60 V, then calculate
- a. the peak value.
- b. the peak-to-peak value.
- c. the average value.

15–13 If the sine wave in Fig. 15–29 has an rms value of 40 V, then calculate
- a. the peak value.
- b. the peak-to-peak value.
- c. the average value.

15–14 If the sine wave of alternating voltage in Fig. 15–30 has a peak value of 25 V, then calculate
- a. the peak current value.
- b. the peak-to-peak current value.
- c. the rms current value.
- d. the average current value.

Figure 15–30



15–15 If the sine wave of alternating voltage in Fig. 15–30 has an rms value of 7.07 V, then calculate
- a. the rms current value.
- b. the peak current value.
- c. the peak-to-peak current value.
- d. the average current value.

15–16 Convert the following values into rms values:
- a. 32 V peak.
- b. 18 V peak-to-peak.
- c. 90.09 V average.
- d. 120 mA peak-to-peak.

15–17 Convert the following values into peak values:
- a. 12 V rms.
- b. 72 V average.
- c. 50 V peak-to-peak.
- d. 750 mV rms.

SECTION 15–6 FREQUENCY

15–18 What is the frequency, *f*, of a sine wave that completes
- a. 10 cycles per second?
- b. 500 cycles per second?
- c. 50,000 cycles per second?
- d. 2,000,000 cycles per second?

15–19 How many cycles per second (cps) do the following frequencies correspond to?
- a. 2 kHz.
- b. 15 MHz.
- c. 10 kHz.
- d. 5 GHz.

SECTION 15–7 PERIOD

15–20 Calculate the period, *T*, for the following sine wave frequencies:
- a. 50 Hz.
- b. 100 Hz.
- c. 500 Hz.
- d. 1 kHz.

15–21 Calculate the period, *T*, for the following sine wave frequencies:
- a. 2 kHz.
- b. 4 kHz.
- c. 200 kHz.
- d. 2 MHz.

15–22 Calculate the frequency, *f*, of a sine wave whose period, *T*, is
- a. 40 μs.
- b. 50 μs.
- c. 2.5 ms.
- d. 16.67 ms.

15–23 Calculate the frequency, *f*, of a sine wave whose period, *T*, is
- a. 5 ms.
- b. 10 μs.
- c. 500 ns.
- d. 33.33 μs.

15–24 For a 5-kHz sine wave, how long does it take for
- a. 1/4 cycle?
- b. 1/2 cycle?
- c. 3/4 cycle?
- d. 1 full cycle?

SECTION 15–8 WAVELENGTH

15–25 What is the velocity of an electromagnetic radio wave in
- a. miles per second (mi/s)?
- b. centimeters per sec (cm/s)?
- c. meters per sec (m/s)?

15–26 What is the velocity in ft/s of a sound wave produced by mechanical vibrations?

15–27 What is the wavelength in cm of an electromagnetic radio wave whose frequency is
- a. 3.75 MHz?
- b. 7.5 MHz?
- c. 15 MHz?
- d. 20 MHz?

15–28 Convert the wavelengths in Prob. 15–27 into meters (m).

15–29 What is the wavelength in meters of an electromagnetic radio wave whose frequency is 150 MHz?

15–30 What is the wavelength in ft of a sound wave whose frequency is
- a. 50 Hz?
- b. 200 Hz?
- c. 750 Hz?
- d. 2 kHz?
- e. 4 kHz?
- f. 10 kHz?

15–31 What is the frequency of an electromagnetic radio wave whose wavelength is
- a. 160 m?
- b. 10 m?
- c. 17 m?
- d. 11 m?

15–32 What is the frequency of a sound wave whose wavelength is
- a. 4.52 ft?
- b. 1.13 ft?
- c. 3.39 ft?
- d. 0.226 ft?

SECTION 15–9 PHASE ANGLE

15–33 Describe the difference between a sine wave and a cosine wave.

15–34 Two voltage waveforms of the same amplitude, V_X and V_Y, are 45° out of phase with each other, with V_Y lagging V_X. Draw the phasors representing these voltage waveforms if
- a. V_X is used as the reference phasor.
- b. V_Y is used as the reference phasor.

SECTION 15–10 THE TIME FACTOR IN FREQUENCY AND PHASE

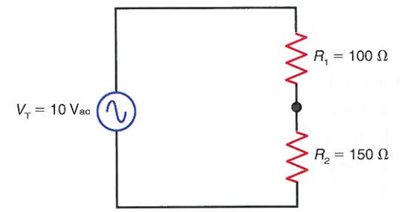
15–35 For two waveforms with a frequency of 1 kHz, how much time corresponds to a phase angle difference of
- a. 30°?
- b. 45°?
- c. 60°?
- d. 90°?

15–36 For two waveforms with a frequency of 50 kHz, how much time corresponds to a phase angle difference of
- a. 15°?
- b. 36°?
- c. 60°?
- d. 150°?

SECTION 15–11 ALTERNATING CURRENT CIRCUITS WITH RESISTANCE

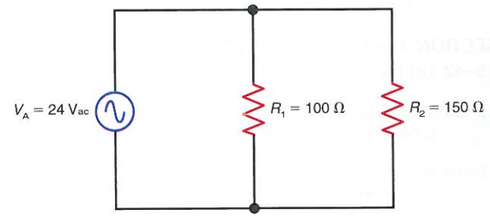
15–37 In Fig. 15–31, solve for the following values: R_T, I, V_1, V_2, P_1, P_2, and P_T.

Figure 15–31



15–38 In Fig. 15–32, solve for the following values: I_1, I_2, I_T, R_{EQ}, P_1, P_2, and P_T.

Figure 15–32



15–39 In Fig. 15–33, solve for the following values: R_T, I_T, V_1, V_2, V_3, I_2, I_3, P_1, P_2, P_3, and P_T.

Figure 15–33