18–23 With R set at 1 kΩ in Fig. 18–21, solve for

a. Z_T, I, V_R, V_C, and θ_Z.

b. the phase relationship between V_T and V_R.

c. the phase relationship between V_T and V_C.

18–24 With R set at 100 kΩ in Fig. 18–21, solve for

a. Z_T, I, V_R, V_C, and θ_Z.

b. the phase relationship between V_T and V_R.

c. the phase relationship between V_T and V_C.

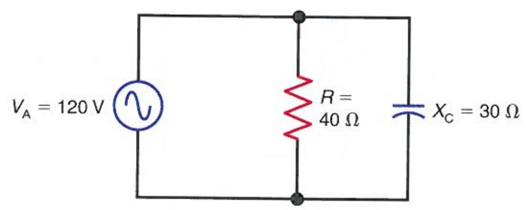
SECTION 18–5 X_C AND R IN PARALLEL

18–25 In Fig. 18–22, how much voltage is across

a. the 40-Ω resistor, R?

b. the 30-Ω capacitive reactance, X_C?

Figure 18–22



18–26 In Fig. 18–22, what is the phase relationship between

a. V_A and I_R?

b. V_A and I_C?

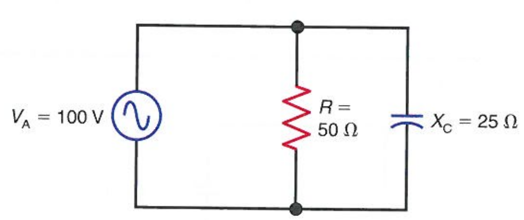
c. I_C and I_R?

18–27 In Fig. 18–22, solve for I_R, I_C, I_T, Z_{EQ}, and θ_I.

18–28 Draw the phasor current triangle for the circuit in Fig. 18–22. (Use I_R as the reference phasor.)

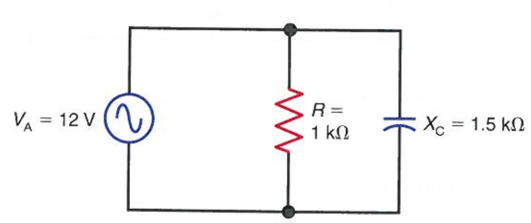
18–29 In Fig. 18–23, solve for I_R, I_C, I_T, Z_{EQ}, and θ_I.

Figure 18–23



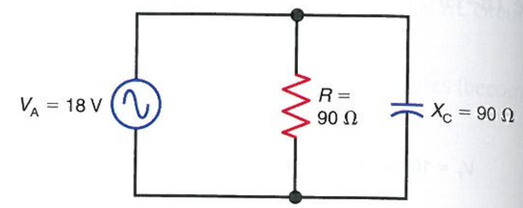
18–30 In Fig. 18–24, solve for I_R, I_C, I_T, Z_{EQ}, and θ_I.

Figure 18–24



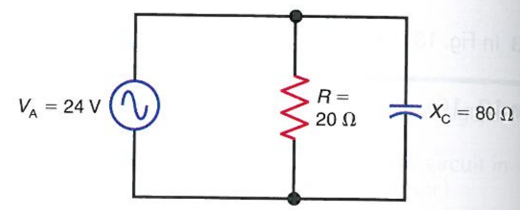
18–31 In Fig. 18–25, solve for I_R, I_C, I_T, Z_{EQ}, and θ_I.

Figure 18–25



18–32 In Fig. 18–26, solve for I_R, I_C, I_T, Z_{EQ}, and θ_I.

Figure 18–26



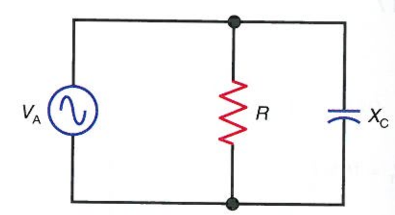
18–33 In Fig. 18–27, solve for I_R, I_C, I_T, Z_{EQ}, and θ_I for the following circuit values:

a. $R = 50\ \Omega$, $X_C = 50\ \Omega$, and $V_A = 50$ V.

b. $R = 10\ \Omega$, $X_C = 100\ \Omega$, and $V_A = 20$ V.

c. $R = 100\ \Omega$, $X_C = 10\ \Omega$, and $V_A = 20$ V.

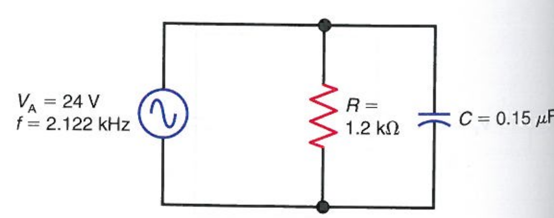
Figure 18–27



18–34 In Fig. 18–27, how much is Z_{EQ} if $R = 60\ \Omega$ and $X_C = 80\ \Omega$?

18–35 In Fig. 18–28, solve for X_C, I_R, I_C, I_T, Z_{EQ}, and θ_I.

Figure 18–28



18–36 In Fig. 18–28, what happens to each of the following quantities if the frequency of the applied voltage increases?

a. I_R.

b. I_C.

c. I_T.

d. Z_{EQ}.

e. θ_I.

18–37 Repeat Prob. 18–36 if the frequency of the applied voltage decreases.

SECTION 18–6 RF AND AF COUPLING CAPACITORS

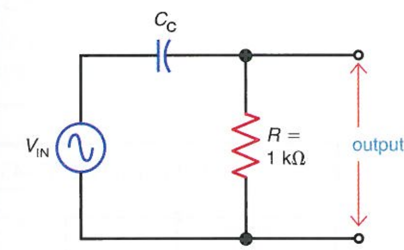
18–38 In Fig. 18–29, calculate the minimum coupling capacitance, C_C, in series with the 1-kΩ resistance, R, if the frequency of the applied voltage is

a. 159.1 Hz.

b. 1591 Hz.

c. 15.91 kHz.

Figure 18–29



18–39 In Fig. 18–29, assume that $C_C = 0.047\ \mu$F and $R = 1$ kΩ, as shown. For these values, what is the lowest frequency of the applied voltage that will provide an X_C of 100 Ω? At this frequency, what is the phase angle, θ_Z?

SECTION 18–7 CAPACITIVE VOLTAGE DIVIDERS

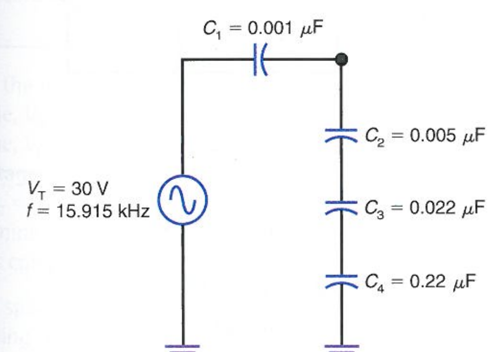
18–40 In Fig. 18–30, calculate the following:

a. X_{C_1}, X_{C_2}, X_{C_3}, X_{C_4}, and X_{C_T}.

b. I.

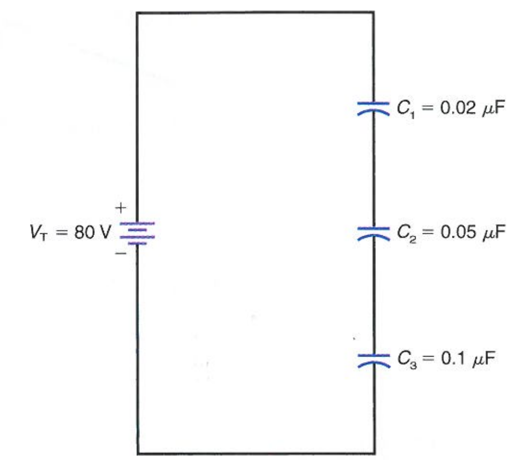
c. V_{C_1}, V_{C_2}, V_{C_3}, and V_{C_4}.

Figure 18–30



18–41 In Fig. 18–31, calculate V_{C_1}, V_{C_2}, and V_{C_3}.

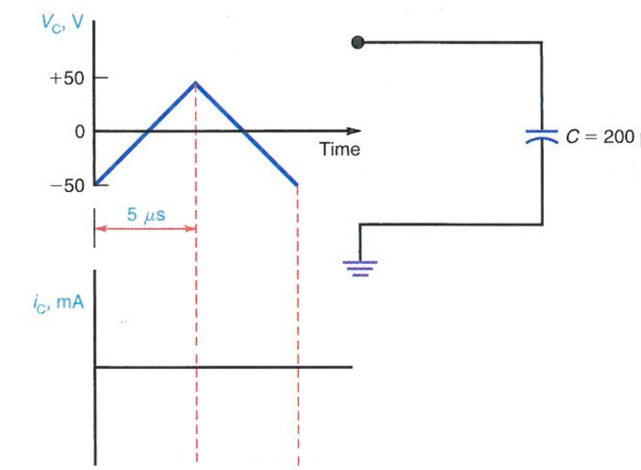
Figure 18–31



SECTION 18–8 THE GENERAL CASE OF CAPACITIVE CURRENT, i_C

18–42 For the waveshape of capacitor voltage, V_C, in Fig. 18–32, show the corresponding charge and discharge current, i_C, with values for a 200-pF capacitance.

Figure 18–32



18–43 In Fig. 18–33, show the corresponding charge and discharge current for the waveshape of capacitor voltage shown.