9.60 Obtain $\mathbf{Z}_{\text{in}}$ for the circuit in Fig. 9.67.

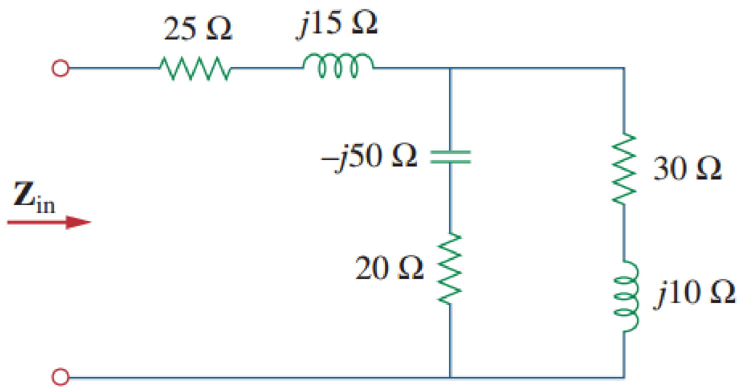

Figure 9.67
For Prob. 9.60.

9.79 (a) Calculate the phase shift of the circuit in Fig. 9.82.
(b) State whether the phase shift is leading or lagging (output with respect to input).
(c) Determine the magnitude of the output when the input is 120 V.

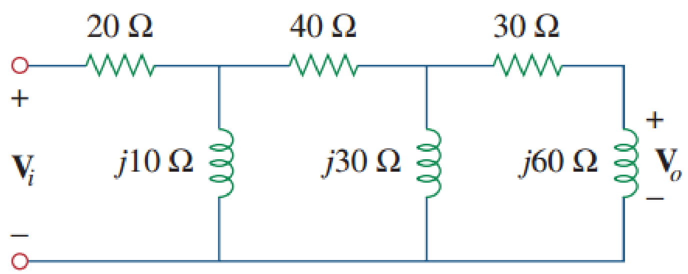

Figure 9.82
For Prob. 9.79.

9.84 The ac bridge shown in Fig. 9.84 is known as a *Maxwell bridge* and is used for accurate measurement of inductance and resistance of a coil in terms of a standard capacitance C_s. Show that when the bridge is balanced,

$$L_x = R_2 R_3 C_s \qquad \text{and} \qquad R_x = \frac{R_2}{R_1} R_3$$

Find L_x and R_x for $R_1 = 40\ \text{k}\Omega$, $R_2 = 1.6\ \text{k}\Omega$, $R_3 = 4\ \text{k}\Omega$, and $C_s = 0.45\ \mu\text{F}$.

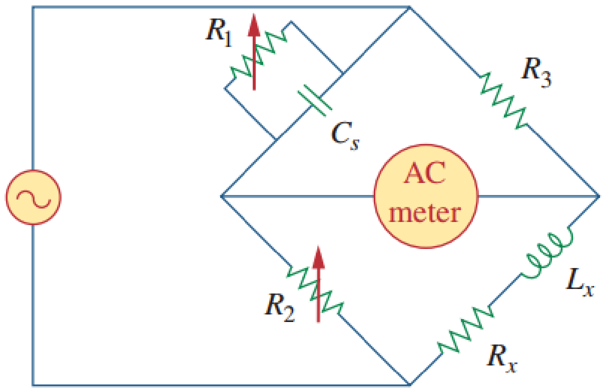

Figure 9.84
Maxwell bridge; For Prob. 9.84.

10.14 Calculate the voltage at nodes 1 and 2 in the circuit of Fig. 10.63 using nodal analysis.

ML

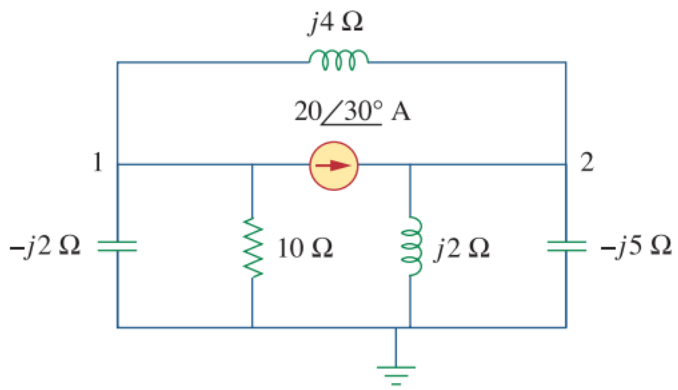

Figure 10.63
For Prob. 10.14.

10.26 Use mesh analysis to find current i_o in the circuit of Fig. 10.74.

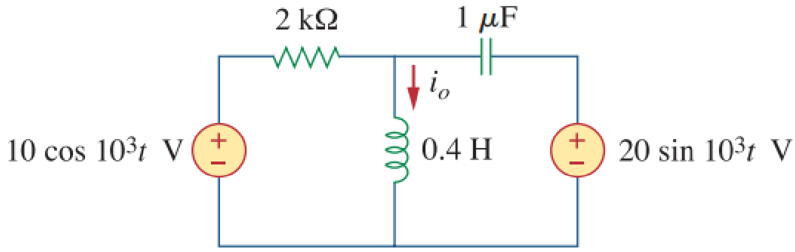

Figure 10.74
For Prob. 10.26.

10.46 Solve for $v_o(t)$ in the circuit of Fig. 10.91 using the superposition principle.

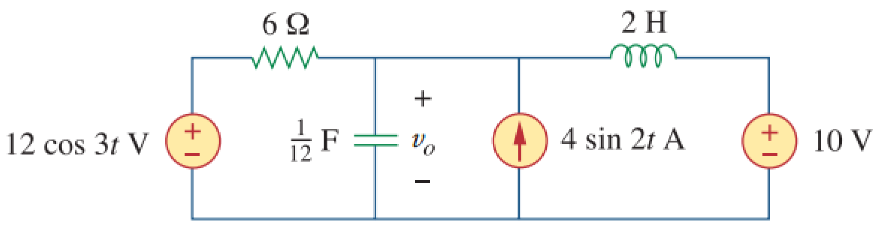

Figure 10.91
For Prob. 10.46.

10.52 Use the method of source transformation to find $\mathbf{I}_x$ in the circuit of Fig. 10.96.

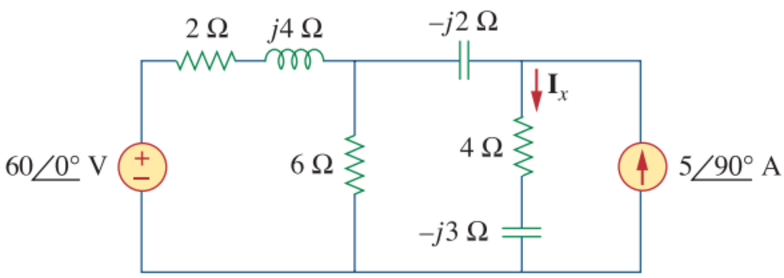

Figure 10.96
For Prob. 10.52.

10.62 Using Thevenin's theorem, find v_o in the circuit of Fig. 10.105.

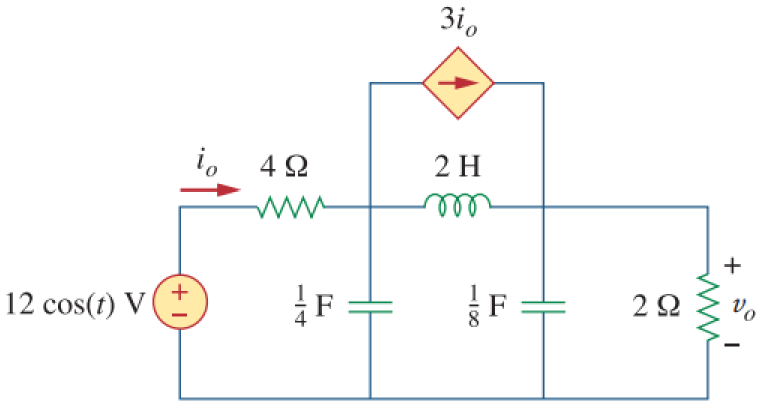

Figure 10.105
For Prob. 10.62.

10.84 Obtain $\mathbf{V}_o$ in the circuit of Fig. 10.126 using *PSpice or MultiSim*.

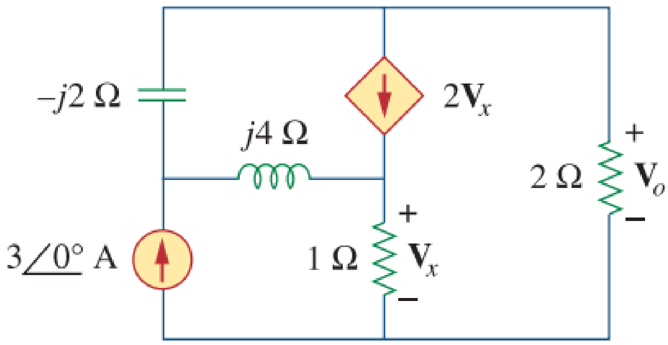

Figure 10.126
For Prob. 10.84.

10.89 The op amp circuit in Fig. 10.131 is called an *inductance simulator*. Show that the input impedance is given by

$$\mathbf{Z}_{\text{in}} = \frac{\mathbf{V}_{\text{in}}}{\mathbf{I}_{\text{in}}} = j\omega L_{\text{eq}}$$

where

$$L_{\text{eq}} = \frac{R_1 R_3 R_4}{R_2} C$$

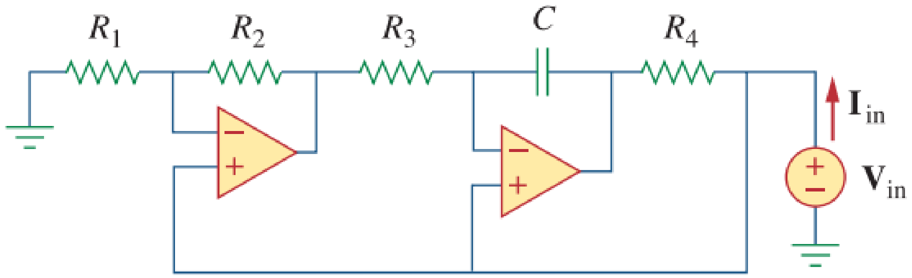

Figure 10.131
For Prob. 10.89.