13.3 Two coils connected in series-aiding fashion have a total inductance of 500 mH. When connected in a series-opposing configuration, the coils have a total inductance of 300 mH. If the inductance of one coil (L_1) is three times the other, find L_1, L_2, and M. What is the coupling coefficient?

13.24 In the circuit of Fig. 13.93,

(a) find the coupling coefficient,

(b) calculate v_o,

(c) determine the energy stored in the coupled inductors at $t = 2$ s.

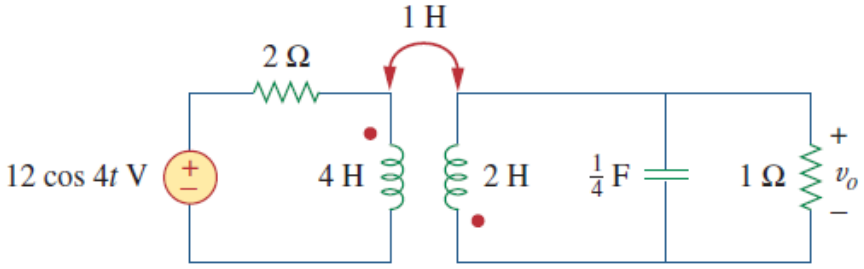

Figure 13.93
For Prob. 13.24.

13.29 In the circuit of Fig. 13.98, find the value of the coupling coefficient k that will make the 10-Ω resistor dissipate 320 W. For this value of k, find the energy stored in the coupled coils at $t = 1.5$ s.

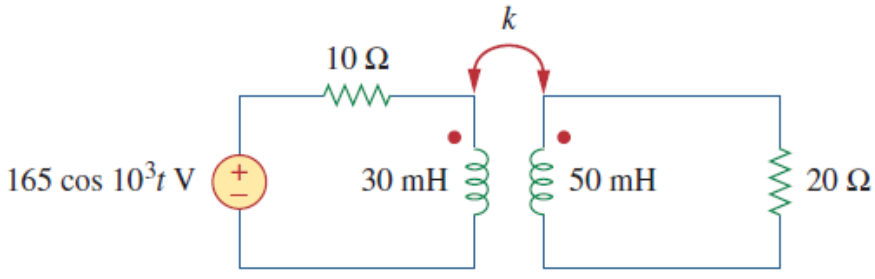

Figure 13.98
For Prob. 13.29.

13.41 Determine $\mathbf{I}_1$ and $\mathbf{I}_2$ in the circuit of Fig. 13.106.

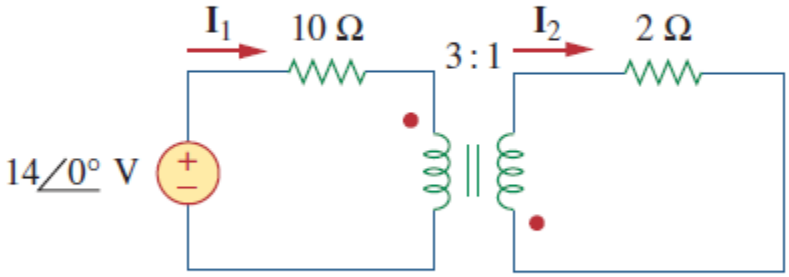

Figure 13.106
For Prob. 13.41.

13.53 Refer to the network in Fig. 13.118.

(a) Find n for maximum power supplied to the 200-Ω load.

(b) Determine the power in the 200-Ω load if $n = 10$.

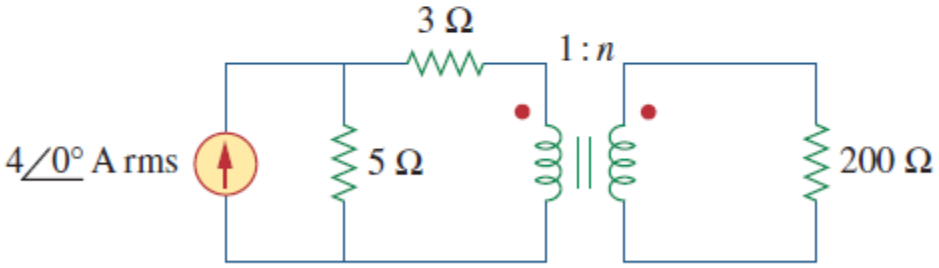

Figure 13.118
For Prob. 13.53.

13.71 In the autotransformer circuit in Fig. 13.134, show that

$$\mathbf{Z}_{\text{in}} = \left(1 + \frac{N_1}{N_2}\right)^2 \mathbf{Z}_L$$

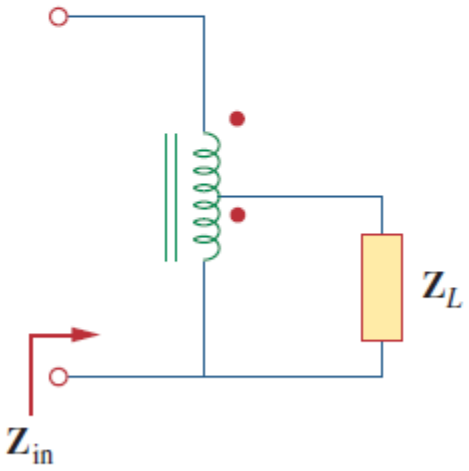

Figure 13.134
For Prob. 13.71.

13.90 A 4-kVA, 2,400/240-V rms transformer has 250 turns on the primary side. Calculate:

(a) the turns ratio,

(b) the number of turns on the secondary side,

(c) the primary and secondary currents.