

43. The resistance of the coil is related to the reactances and the phase constant by Eq. 33-65. Thus,

$$\frac{X_L - X_C}{R} = \frac{\omega_d L - 1/\omega_d C}{R} = \tan \phi ,$$

which we solve for  $R$ :

$$\begin{aligned} R &= \frac{1}{\tan \phi} \left( \omega_d L - \frac{1}{\omega_d C} \right) \\ &= \frac{1}{\tan 75^\circ} \left[ (2\pi)(930 \text{ Hz})(8.8 \times 10^{-2} \text{ H}) - \frac{1}{(2\pi)(930 \text{ Hz})(0.94 \times 10^{-6} \text{ F})} \right] \\ &= 89 \, \Omega . \end{aligned}$$