6-7 Soln)

First, find the frequency, ω:

$$\omega = 2\pi f = 2\pi(120) = 754\,\frac{\text{rad}}{\text{s}}.$$

This is an LRC circuit without the capacitor, so we just ignore and capacitive terms in the formulas. The 'combined' voltage drops due to the resistance and the inductance correspond to the applied emf, so

$$\tan\varphi = \frac{\chi_L}{R} = \frac{\omega L}{R}$$

$$L = \frac{R\tan\varphi}{\omega} = \frac{63(\tan 67^\circ)}{754} = 0.20\ \text{H}\ .$$