Ch. 15 Prob. 55 $I_L = 4.24\,A$

Find the value of the resistor

The current given is an amplitude, or peak value.
The amplitude of the voltage is $V_0 = 50V$

Since the inductor is in series with the inductor
the power supply current is the same as the inductors

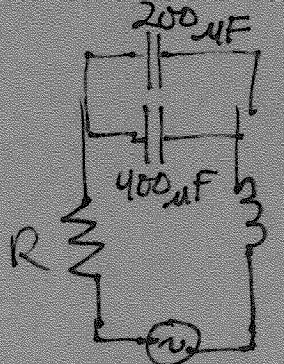
$$\therefore\ V_0 = I_0 \cdot Z \rightarrow Z = \frac{V_0}{I_0} = \frac{50V}{4.24A} = 11.8\,\Omega$$

The angular frequency is

$$\omega = 120\pi\ \frac{rad}{s}$$

The equivalent single capacitor is due to the 2 capacitors in parallel. Therefore

$$C = 200 + 400 = 600\,\mu F$$



Capacitive reactance is $X_C = \frac{1}{\omega C} = \frac{1}{(120\pi)(600\times10^{-6})}$

$$\boxed{X_C = 4.42\,\Omega}$$

Inductive reactance is $X_L = \omega L = (120\pi)(8.0\times10^{-3})$

$$\boxed{X_L = 3.02\,\Omega}$$

Since $Z = \sqrt{R^2 + (X_L - X_C)^2}$

$$Z^2 = R^2 + (X_L - X_C)^2$$

$$R^2 = Z^2 - (X_L - X_C)^2 \rightarrow R = \sqrt{Z^2 - (X_L - X_C)^2}$$

$$R = \sqrt{(11.8)^2 - (3.02 - 4.42)^2} = \boxed{11.7\,\Omega}$$