81. (a) We find L from $X_L = \omega L = 2\pi f L$:

$$f = \frac{X_L}{2\pi L} = \frac{1.30 \times 10^3 \Omega}{2\pi(45.0 \times 10^{-3}\,\text{H})} = 4.60 \times 10^3 \text{ Hz} .$$

(b) The capacitance is found from $X_C = (\omega C)^{-1} = (2\pi f C)^{-1}$:

$$C = \frac{1}{2\pi f X_C} = \frac{1}{2\pi(4.60 \times 10^3\,\text{Hz})(1.30 \times 10^3\,\Omega)} = 2.66 \times 10^{-8} \text{ F} .$$

(c) Noting that $X_L \propto f$ and $X_C \propto f^{-1}$, we conclude that when f is doubled, X_L doubles and X_C reduces by half. Thus, $X_L = 2(1.30\times10^3\,\Omega) = 2.60\times10^3\,\Omega$ and $X_C = 1.30\times10^3\,\Omega/2 = 6.50\times10^2\,\Omega$.