38. (a) Now $X_L = 0$, while $R = 160\,\Omega$ and $X_C = 177\,\Omega$ remain as shown in the Sample Problem. Therefore, the impedance, current amplitude and phase angle are

$$\begin{aligned} Z &= \sqrt{R^2 + X_C^2} = \sqrt{(160\,\Omega)^2 + (177\,\Omega)^2} = 239\ \Omega\ , \\ I &= \frac{\mathcal{E}_m}{Z} = \frac{36.0\,\text{V}}{239\,\Omega} = 0.151\ \text{A}\ , \\ \phi &= \tan^{-1}\left(\frac{X_L - X_C}{R}\right) = \tan^{-1}\left(\frac{0 - 177\,\Omega}{160\,\Omega}\right) = -47.9^\circ\ . \end{aligned}$$

(b) We first find the voltage amplitudes across the circuit elements:

$$\begin{aligned} V_R &= IR = (0.151\,\text{A})(160\,\Omega) \approx 24\ \text{V} \\ V_C &= IX_C = (0.151\,\text{A})(177\,\Omega) \approx 27\ \text{V} \end{aligned}$$

The circuit is capacitive, so I leads $\mathcal{E}_m$. The phasor diagram is drawn to scale below.