

71. (a) The impedance is

$$Z = \frac{\mathcal{E}_m}{I} = \frac{125 \text{ V}}{3.20 \text{ A}} = 39.1 \, \Omega .$$

- (b) From  $V_R = IR = \mathcal{E}_m \cos \phi$ , we get

$$R = \frac{\mathcal{E}_m \cos \phi}{I} = \frac{(125 \text{ V}) \cos(0.982 \text{ rad})}{3.20 \text{ A}} = 21.7 \, \Omega .$$

- (c) Since  $X_L - X_C \propto \sin \phi = \sin(-0.982 \text{ rad})$ , we conclude that  $X_L < X_C$ . The circuit is predominantly capacitive.