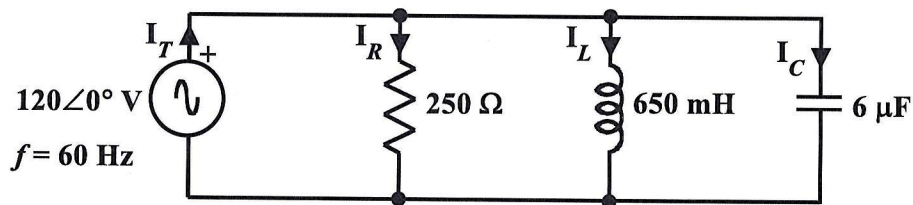


Homework Problem #008

Construct a phasor diagram showing the relative magnitudes and phase angles of I_R , I_L , I_C , and I_T . A sheet of polar graph paper is attached.



$$\omega = 2\pi f = 120\pi \approx 377 \text{ rad/s}$$

$$\bar{I}_R = \frac{120 \angle 0^\circ}{250} = 0.48 \angle 0^\circ \text{ A}$$

$$\bar{I}_L = \frac{120 \angle 0^\circ}{j377(0.650)} = 0.49 \angle -90^\circ \text{ A}$$

$$\begin{aligned} \bar{I}_C &= \frac{120 \angle 0^\circ}{\left(\frac{1}{j377(6 \times 10^{-6})}\right)} = j377(6 \times 10^{-6})(120 \angle 0^\circ) \\ &= 0.27 \angle 90^\circ \text{ A} \end{aligned}$$

$$\begin{aligned} \bar{I}_T &= \bar{I}_R + \bar{I}_L + \bar{I}_C \\ &= 0.48 - j0.49 + j0.27 \\ &= 0.48 - j0.22 \\ &= 0.53 \angle -24^\circ \text{ A} \end{aligned}$$

