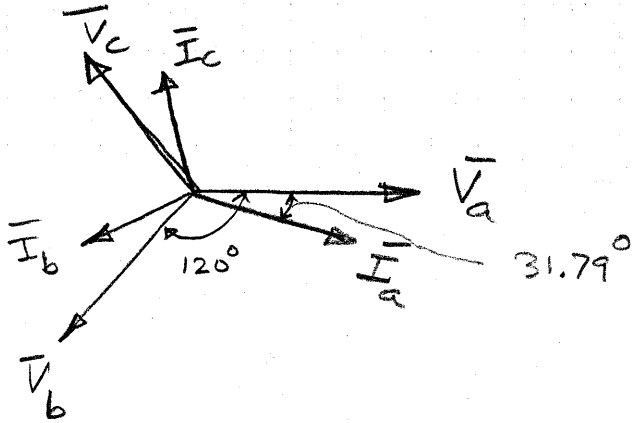
Problem 3-7

3-ϕ system, $V_{ph} = 120V$ (rms).

$P = 10$ kW at 0.85 PF (Lagging).

power factor angle $\phi = \cos^{-1}(0.85) = 31.79^\circ$



$$P = 3 V_{ph} I_{ph} \cos\phi = 10{,}000$$

$$\therefore I_{ph} = 32.68 \text{ A}$$

$$|\bar{Z}| = \frac{V_{ph}}{I_{ph}} = \frac{120}{32.68} = 3.67\ \Omega$$

assuming it to be Y- connected.