

31.24

Datos

$$f = 120 \text{ Hz}$$

La potencia media para un circuito RLC es:

$$V_{\text{rms}} = 80 \text{ V}$$

$$P_{\text{med}} = I_{\text{rms}} V_{\text{rms}} \cos \phi$$

$$R = 75 \Omega$$

$$\text{Como } I_{\text{rms}} = \frac{V_{\text{rms}}}{Z}$$

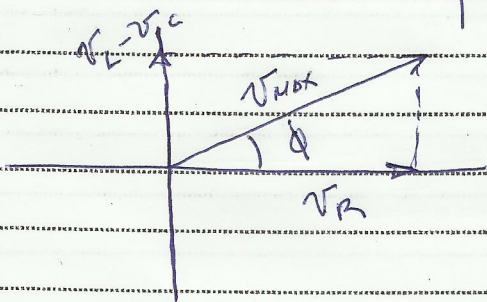
$$Z = 105 \Omega$$

$$P_{\text{med}} = ?$$

$$P_{\text{med}} = \left(\frac{V_{\text{rms}}}{Z} \right) (V_{\text{rms}}) (\cos \phi)$$

$$P_{\text{med}} = \frac{V_{\text{rms}}^2}{Z} \cos \phi$$

Para determinar $\cos \phi$ hacemos un análisis fasorial



$$\cos \phi = \frac{V_R}{V_{\text{MAX}}} = \frac{I_{\text{MAX}} R}{I_{\text{MAX}} Z} = \frac{R}{Z}$$

$$\cos \phi = \frac{R}{Z}$$

$$P_{\text{med}} = \frac{V_{\text{rms}}^2}{Z} \left(\frac{R}{Z} \right) = \frac{(V_{\text{rms}})^2 R}{Z^2} = 43.5 \text{ W}$$