01.03.2012 r.

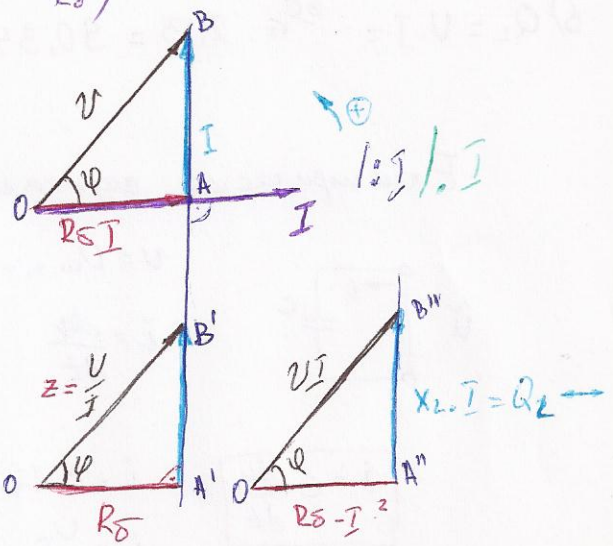
$$\underline{I}_m = \frac{U_m}{\sqrt{R_\delta^2 + X_L^2}}$$

$$\varphi = \alpha = \operatorname{arctg} \frac{X_L}{R_\delta}$$

$$i = \frac{U_m}{\sqrt{R_\delta^2 + X_L^2}} \cos\left(\omega t - \operatorname{arctg} \frac{X_L}{R_\delta}\right) + j \frac{U_m}{\sqrt{R_\delta^2 + X_L^2}} \sin\left(\omega t - \operatorname{arctg} \frac{X_L}{R_\delta}\right)$$

$$i = \operatorname{Im}(\underline{i})$$

$$\boxed{i = \frac{U_m}{\sqrt{R_\delta^2 + X_L^2}} \sin\left(\omega t - \operatorname{arctg} \frac{X_L}{R_\delta}\right)}$$



$$p = u \cdot i = U_m \sin\omega t \cdot I_m \sin(\omega t - \varphi) =$$

$$= \sqrt{2}\, U \cdot \sqrt{2}\, I \frac{1}{2}\left[\cos(\omega t - \omega t + \varphi) - \cos(\omega t + \omega t - \varphi)\right] =$$

$$\boxed{\sin\alpha \cdot \sin\beta = \frac{1}{2}\left[\cos(\alpha - \beta) - \cos(\alpha + \beta)\right]}$$

$$= U I \left[\cos\varphi - \cos(2\omega t - \varphi)\right]$$

$$P = \frac{1}{T}\int_0^T p\,dt = \frac{1}{T_0}\int_0^T U I \cos\varphi\, dt - \frac{1}{T_0}\underbrace{\int_0^T U I \cos(2\omega t - \varphi)\, dt}_{=0} =$$

$$= U I \cos\varphi$$

$$\boxed{P = U I \cos\varphi}$$

$$S = U I \ [VA]$$

$$P = U I \cos\varphi \ [W]$$

$$Q_L = U I \sin\varphi \ [var]$$

$$S = \sqrt{P^2 + Q_L^2}$$