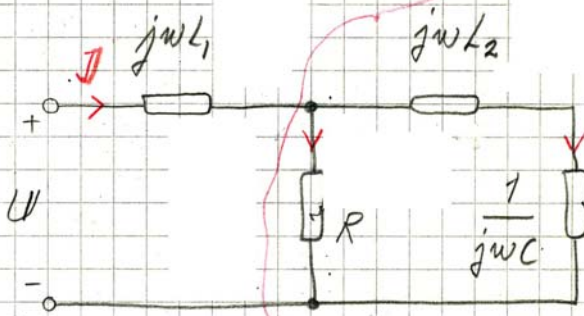


B2.2



GIVET :

$$u(t) = \underbrace{\sqrt{2}}_{\hat{U}} \cdot 4 \sin(\omega t + 0^\circ) \Rightarrow U = 4\sqrt{2} \cdot e^{j0^\circ} \text{ V}$$

$$U = \frac{\hat{U}}{\sqrt{2}} \rightarrow U = 4 \text{ V}$$

$$R = 3 \Omega$$

$$\omega L_1 = \omega L_2 = 2 \Omega$$

$$\frac{1}{\omega C} = 1 \Omega$$

$$Z_{\text{TOT}} = Z_1 + Z$$

$$Z_1 = j\omega L_1$$

$$Z = \frac{R(j\omega L_2 + \frac{1}{j\omega C})}{R + j\omega L_2 + \frac{1}{j\omega C}}$$

$$Z_{\text{TOT}} = j2 + \frac{3(j2 - j1)}{3 + j2 - j1} = j2 + \frac{j3}{3 + j} =$$

$$= j2 + \frac{j3(3-j)}{(3+j)(3-j)} = j2 + j0,9 + 0,3 = (0,3 + j2,9) \Omega$$

$$= \sqrt{0,3^2 + 2,9^2} \cdot e^{j \arctan \frac{2,9}{0,3}} = 2,92 \cdot e^{j84^\circ}$$

$$I = \frac{U}{Z_{TOT}} \Rightarrow I = \frac{\sqrt{2} \cdot 4}{2,92 \cdot e^{j84^\circ}} A = \underbrace{\sqrt{2} \cdot 1,37}_{\hat{I}} e^{-j84^\circ}$$

$$I = \frac{\hat{I}}{\sqrt{2}} \rightarrow I = 1,37 A$$

$$S = U \cdot I \rightarrow S = 4 \cdot 1,37 VA = 5,48 VA$$

$$P = S \cdot \cos \varphi \Rightarrow P = 5,48 \cdot \cos 84^\circ W \approx 0,56 W$$

$$Q = S \cdot \sin \varphi \Rightarrow Q = 5,48 \cdot \sin 84^\circ VAR \approx 5,45 VAR$$

OBS! VID EFFEKTBERÄKNING MÅSTE ALLTID EFFEKTIVVÄRDEN ANVÄNDAS PÅ SPÄNNING OCH STRÖM.

NOTERA OCKSÅ ATT $\varphi = \arg U - \arg I$

$$Z_{TOT} = \frac{U}{I} \Rightarrow \arg Z_{TOT} = \arg \left(\frac{U}{I} \right) = \arg U - \arg I$$

ALLTSÅ $\varphi = \arg Z_{TOT}$