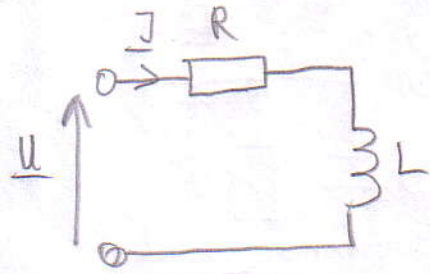


$$\underline{u} = 230 \sqrt{2} [\text{V}], \quad \varphi_u = \frac{\pi}{2} [\text{rad}], \quad L = 10 [\text{mH}]$$

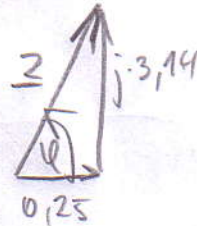
$$R = 0,25 [\Omega], \quad f = 50 [\text{Hz}]$$

$$\underline{I} = ? , \quad \underline{S} = ? , \quad P = ? , \quad Q = ?$$



$$\underline{Z} = R + j \cdot \omega \cdot L = 0,25 + j \cdot 2 \cdot \pi \cdot 50 \cdot 10 \cdot 10^{-3} = 0,25 + j \cdot 3,14$$

$$\underline{I} = \frac{\underline{U}}{\underline{Z}} = \underline{U} \cdot \underline{Y} \rightarrow \underline{Y} = \frac{1}{\underline{Z}}$$



$$\underline{u} = u \cdot e^{j \cdot \varphi_u}$$

$$\underline{I} = I \cdot e^{j \cdot \varphi_I}$$

$$\underline{Z} = Z \cdot e^{j \cdot \varphi}$$

$$\varphi = \varphi_u - \varphi_I$$

$$Z = \sqrt{R^2 + X^2} = \sqrt{0,25^2 + 3,14^2} = 3,15 [\Omega]$$

$$\varphi = \arctan \frac{X}{R} = \arctan \left( \frac{3,14}{0,25} \right) = 1,49 [\text{rad}]$$

$$\underline{Z} = Z \cdot e^{j \cdot \varphi} = 3,15 \cdot e^{j \cdot 1,49}$$

$$\underline{I} = \frac{\underline{U}}{\underline{Z}} = \frac{230 \cdot e^{j \cdot \frac{\pi}{2}}}{3,15 \cdot e^{j \cdot 1,49}} = \frac{230}{3,15} \cdot e^{j \cdot (\frac{\pi}{2} - 1,49)} = 73 \cdot e^{j \cdot 0,11}$$

$$\underline{S} = \underline{U} \cdot \underline{I}^* = 230 \cdot e^{j \cdot \frac{\pi}{2}} \cdot 73 \cdot e^{-j \cdot 0,11} = 16790 \cdot e^{j \cdot 1,49}$$

$$\underline{S} = 16790 \cdot e^{j \cdot 1,49} \rightarrow \underline{S} = 16,79 \text{ VVA}$$

$$\underline{S} = 16790 \cdot \cos 1,49 + j \cdot 16790 \cdot \sin 1,49$$

$$P = \text{Re } \underline{S} = 16790 \cdot \cos 1,49 = 1355 [\text{W}]$$

$$Q = \text{Im } \underline{S} = 16790 \cdot \sin 1,49 = 16725 [\text{VAr}]$$

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

