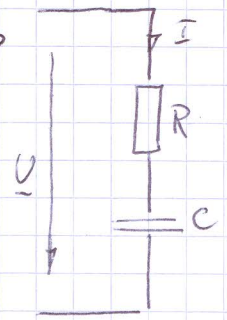
• Bsp



$\underline{U} = 230\,V$

$R = 1000\,\Omega \qquad X_C = 1k\Omega \qquad f = 50\,Hz$

$C = ? \quad \underline{Z} = ? \quad \underline{I} = ?$

$$X_C = \frac{1}{\omega C} \rightarrow C = \frac{1}{\omega X_C} = \frac{1}{2\pi f \cdot X_C} =$$

$$C = \frac{1}{2\pi 50 \cdot 1000} = 3{,}18\,\mu F$$

$$\underline{Z} = R - j X_C = 1000 - j\,1000\,\Omega$$

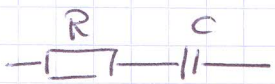
$$Z = \sqrt{1000^2 + 1000^2} = 1000\sqrt{2} = 1414\,\Omega$$

$$\varphi = -45°$$

$$\underline{Z} = 1414\,\angle -45°\,\Omega = 1414\,\Omega\,\angle -45°$$

$$\underline{I} = \frac{\underline{U}}{\underline{Z}} = \frac{230\,\angle 0}{1414\,\angle -45°} = 0{,}162\,A\,\angle 45°$$

• Bsp



geg $R = 300\,\Omega$

$Z = 400\,\Omega$; $f = 50\,Hz$

ges $C = ?$

$$X_C = \sqrt{Z^2 - R^2} = \sqrt{400^2 - 300^2} = 264{,}57\,\Omega$$

$$X_C = \frac{1}{\omega C} \rightarrow C = \frac{1}{\omega X_C} = \frac{1}{2\pi f X_C} =$$