

**KAAVAT JOTKA TULEE OSATA KOKEESSA ULKOA**

$$U = \frac{\hat{u}}{\sqrt{2}} \quad I = \frac{\hat{i}}{\sqrt{2}}$$

$$\omega = 2 \times \pi \times f$$

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

$$X_L = \omega \times L = 2 \times \pi \times f \times L$$

**VAIHTOSÄHKÖ TEHOT**

$$S = U \times I$$

$$P = U \times I \times \cos(\varphi)$$

$$Q = U \times I \times \sin(\varphi)$$

$$S = \sqrt{P^2 + Q^2} = \sqrt{P^2 + (Q_L - Q_C)^2}$$

$$Z = \sqrt{R^2 + X^2} = \sqrt{R^2 + (X_L - X_C)^2}$$

$$\bar{Z} = \frac{\bar{U}}{\bar{I}} = \frac{U \angle 0^\circ}{I \angle \varphi} = Z \angle 0^\circ - \varphi = Z \angle -\varphi$$

$$\bar{I} = \frac{\bar{U}}{\bar{Z}} = \frac{U \angle 0^\circ}{Z \angle \varphi} = I \angle 0^\circ - \varphi = I \angle -\varphi$$

**NÄMÄKIN OLISI HYVÄ, SUOSITELTAVAA, OSATA ULKOA**