

Kap 31 Vekselstrøm

Def Strøm :

$$i = \frac{dq}{dt}$$

Strøm - Spenning :

$$i = I \cos(\omega t)$$

$$v = V \cos(\omega t + \phi)$$

Spenning :

$$v_R = Ri = RI \cos(\omega t)$$

I fase med i

$$v_C = \frac{q}{C} = \frac{I}{\omega C} \sin(\omega t) = \frac{I}{\omega C} \cos(\omega t - \frac{\pi}{2}) \quad \frac{\pi}{2} \text{ etter } i$$

$$v_L = L \frac{di}{dt} = -\omega LI \sin(\omega t) = \omega LI \cos(\omega t + \frac{\pi}{2}) \quad \frac{\pi}{2} \text{ før } i$$

Amplitude :

$$V_R = RI$$

$$V_C = X_C I \quad X_C = \frac{1}{\omega C} \quad \text{Kapasitiv reaktans}$$

$$V_L = X_L I \quad X_L = \omega L \quad \text{Induktiv reaktans}$$

$$V = ZI \quad Z = \sqrt{R^2 + (X_L - X_C)^2} \quad \text{Impedans}$$

$$\tan(\phi) = \frac{\omega L - \frac{1}{\omega C}}{R}$$

Rms :

$$I_{rms} = \frac{I}{\sqrt{2}}$$

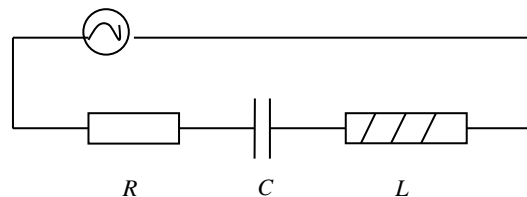
$$V_{rms} = \frac{V}{\sqrt{2}}$$

Effekt :

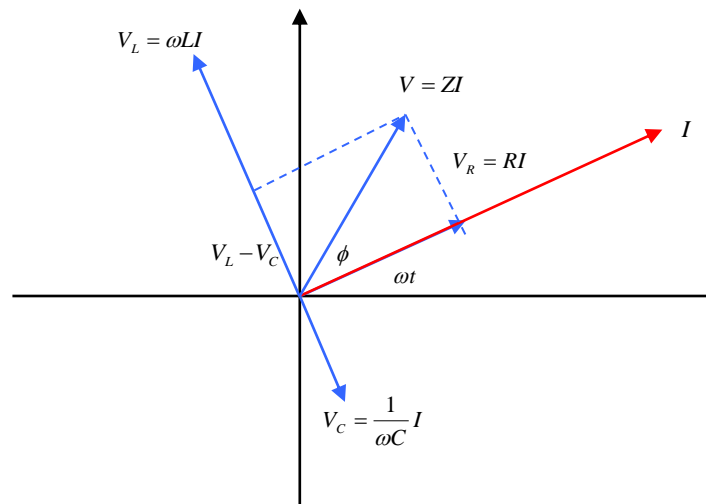
$$P_{av} = \frac{1}{2} VI \cos(\phi) = V_{rms} I_{rms} \cos(\phi)$$

$$i = I \cos(\omega t)$$

$$v = V \cos(\omega t + \phi)$$



$$v_R = Ri \quad v_C = \frac{q}{C} \quad v_L = L \frac{di}{dt}$$



Svingetid :

$$T = \frac{2\pi}{\omega}$$

$\frac{\pi}{2}$ svarer til $T/4$

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Transformator

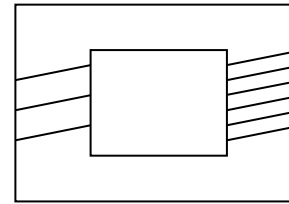
$$\varepsilon_1 = -N_1 \frac{d\Phi_B}{dt}$$

$$\varepsilon_2 = -N_2 \frac{d\Phi_B}{dt}$$

$$\frac{\varepsilon_1}{\varepsilon_2} = \frac{N_1}{N_2}$$

$$\frac{V_1}{V_2} = \frac{N_1}{N_2}$$

$$V_1 I_1 = V_2 I_2$$



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