(25U)

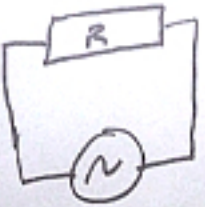
$\mathcal{E} = -\frac{d\Phi_M}{dt}$

$\Phi_M = B \cdot W \cdot x \qquad x = x_0 + Ct^3$

$\frac{d\Phi_M}{dt} = BW \frac{dx}{dt} \Big/ \frac{dt}{dt} = 3Ct^2$

$|\mathcal{E}| = BW \cdot 3Ct^2$

$I = \frac{|\mathcal{E}|}{R} = \frac{3BWCt^2}{R}$



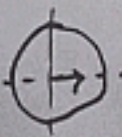
$$v = V_m \sin(\omega t)$$

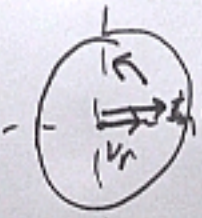
$$\omega = 2\pi f$$

$$i = \frac{V_r}{R} = \frac{V_m}{R} \sin(\omega t)$$

$$I_m = \frac{V_m}{R}$$

$$V_r = I_m R \sin(\omega t)$$





$$P = i^2 R$$

$$\langle P \rangle = \langle i^2 R \rangle = I_m^2 R \langle \sin^2(\omega t) \rangle$$

$$\langle \sin^2(\omega t) \rangle = \frac{1}{2}$$

$$\langle P \rangle = \frac{1}{2} I_m^2 R$$

$$V_{Rms} = \frac{V_m}{\sqrt{2}} \quad I_{Rms} = \frac{I_m}{\sqrt{2}}$$

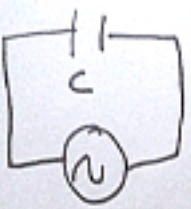
$$\langle P \rangle = V_{Rms} I_{Rms}$$

$V = V_m \sin(\omega t)$

$C = \frac{Q}{V} \Rightarrow Q = CV$

$\frac{dQ}{dt} = C\frac{dV}{dt} = C \cdot \omega V_m \cos(\omega t)$

$i_c = \omega C V_m \sin(\omega t + \frac{\pi}{2})$



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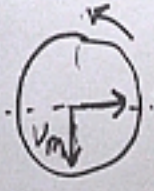
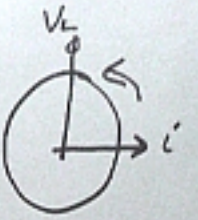


$$I_m = \omega C V_m$$

$$\boxed{X_C \equiv \frac{1}{\omega C}}$$ Capacitive Reactance

$$V_m = I_m X_C$$

$$\therefore v_C = I_m X_C \sin(\omega t)$$



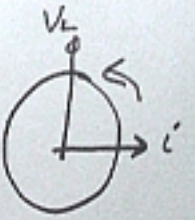
$V = V_m \sin(\omega t)$

$\mathcal{E} = -L\frac{dI}{dt}$

$i_L = -\frac{V_m}{\omega L}\cos(\omega t)$

$i_L = \frac{V_m}{\omega L}\sin(\omega t + \frac{\pi}{2})$

$X_L = \omega L$



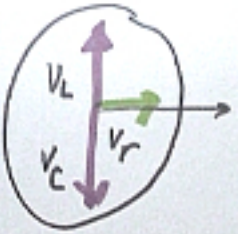
$V = V_m \sin(\omega t)$

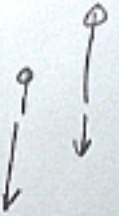
$\varepsilon = -L \frac{dI}{dt}$

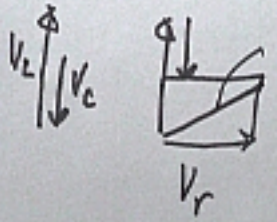
$i_L = -\frac{V_m}{\omega L} \cos(\omega t)$

$i_L = \frac{V_m}{\omega L} \sin(\omega t + \frac{\pi}{2})$

$X_L = \omega L$







$$V = \sqrt{V_R^2 + (V_L - V_C)^2}$$

$$V_R = I_m R \quad V_C = I_m X_C$$

$$V_L = I_m X_L$$

V_r

$V_R = I_m R \quad V_C = I_m X_C$

$V_L = I_m X_L$

$V = \sqrt{I_m R^2 + (X_L - X_C)^2}$

$V = I_m \sqrt{R^2 + (X_L - X_C)^2}$

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

$V = I_m Z$

$V = IR$

ϕ

$V_L - V_C$

V_R

$\cos\phi = \frac{R}{Z}$

$P = IV\cos\phi$

V_r

$V_R = I_m R \quad V_C = I_m X_C$

$V_L = I_m X_L$

$V = \sqrt{I_m R^2 + (X_L - X_C)^2}$

$V = I_m \sqrt{R^2 + (X_L - X_C)^2}$

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

$V = I_m Z$

$V = V_R$

ϕ | $V_L - V_C$

V_R

$\cos\phi = \frac{R}{Z}$

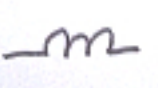
$P = IV\cos\phi$

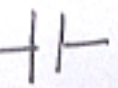
$$Z = \sqrt{R^2 + (X_L - X_C)^2}$$

$$X_L = X_C$$

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

$$\Rightarrow \omega_{res} = \frac{1}{\sqrt{LC}}$$





Lf: —

$X_L = \omega L$

H: — \

Lf: — \ \

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

Hf: —

C R

R