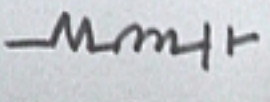
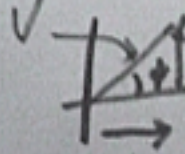
2=6

$R, X_C = \frac{1}{\omega C}, X_L = \omega L$

$\omega = 2\pi f$



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



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

$= IZ$

$\tan\phi = \frac{V_L - V_C}{V_R} = \frac{X_L - X_C}{R}$

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

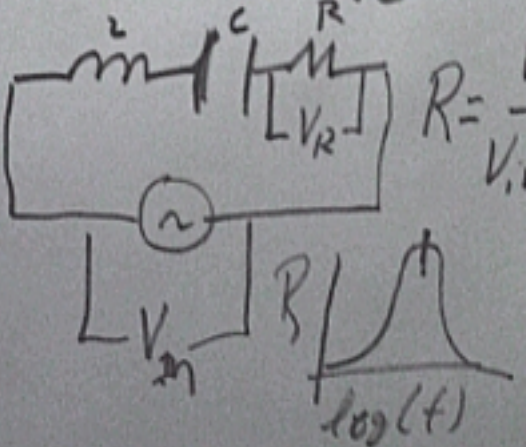
$$\langle \text{power} \rangle = \frac{1}{2} I_{RMS} V_{RMS} \cos\phi$$

$$I_{RMS} = \frac{I}{\sqrt{2}} \quad V_{RMS} = \frac{V}{\sqrt{2}}$$

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

$$\langle \text{power} \rangle = \frac{1}{2} I_{RMS} V_{RMS} \cos\phi$$

$$I_{RMS} = \frac{I}{\sqrt{2}} \qquad V_{RMS} = \frac{V}{\sqrt{2}}$$

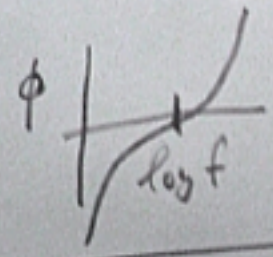


$$R = \frac{V_R}{V_{in}}$$

if $X_L = X_C$

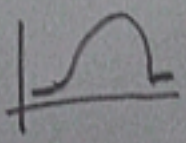
$Z = \sqrt{R^2 + (X_L - X_C)^2}$

$\rightarrow Z = R \;,\; \phi = 0$



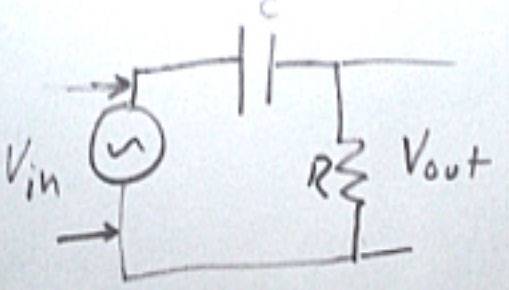
⊣⊢ $X_C = \frac{1}{\omega C}$ Lf: ⎽╲ Hf: ⎽

⏦ $X_L = \omega L$ Lf: ⎽ Hf: ⎽╲



$X_L = X_C$

$\omega = \frac{1}{\sqrt{LC}} = 2\pi f$

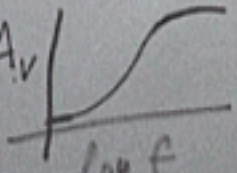


$$A_v = \frac{V_{out}}{V_{in}} = \frac{IR}{IZ}$$

$$= \frac{R}{\sqrt{R^2 + X_c^2}} = \frac{\omega RC}{\sqrt{1 + (\omega RC)^2}}$$

$\tau_c = RC$

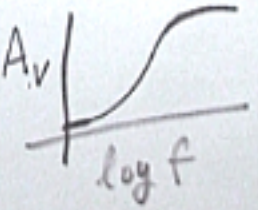
$X_c = \frac{1}{\omega C}$

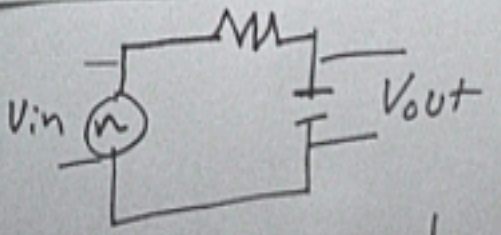


A_V

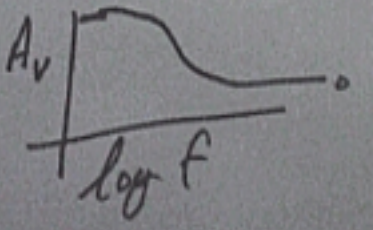
$$= \frac{R}{\sqrt{R^2 + X_C^2}} = \frac{\omega RC}{\sqrt{1 + (\omega RC)^2}}$$

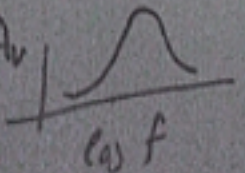
$X_C = \frac{1}{\omega C}$





$$A_V = \frac{X_C}{Z} = \frac{\frac{1}{\omega C}}{\sqrt{R^2 + \left(\frac{1}{\omega C}\right)^2}} = \frac{1}{\sqrt{1 + (\omega RC)^2}}$$





$$\oint \vec{B} \cdot d\vec{s} = \mu_0 I_C = \mu_0 I$$

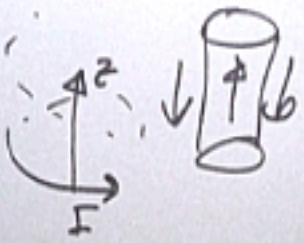
$$B(2\pi s) = \mu_0 I$$

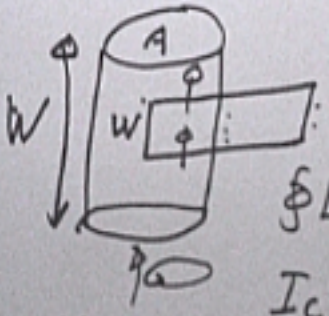
$$\vec{B} = \frac{\mu_0 I}{2\pi s}\hat{\theta}$$

$$\oint \vec{B} \cdot d\vec{s} = B(2\pi s)$$

$$I_C = \frac{I}{\pi a^2}(\pi s^2)$$

$$I_C = I\frac{s^2}{a^2} \quad // \quad \vec{B} = \frac{\mu_0 I s}{2\pi a^2}\hat{\theta}$$





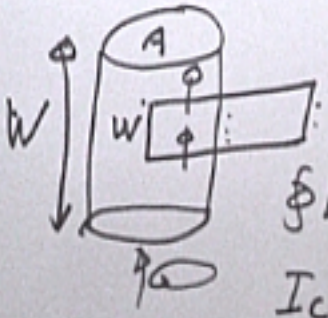
$$\oint \vec{B} \cdot d\vec{s} = BW$$

$$I_c = NI$$

$$n = \frac{N}{W} \qquad B = \mu_0 \left(\frac{N}{W}\right) I = \mu_0 n I$$

$$\phi_M = N(\mu_0 n I) A \quad \leftarrow \text{vol}$$

$$= \mu_0 n^2 I (AW)$$



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$$\phi_M = N(\mu_0 n I) A \quad \leftarrow \text{vol}$$

$$= \mu_0 n^2 I (AW)$$

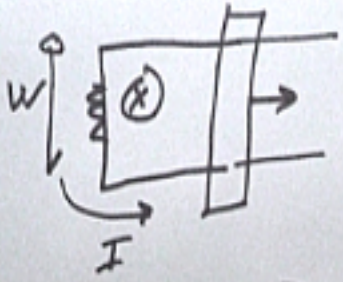
$$L = \frac{\phi_M}{I} = \mu_0 n^2 (AW)$$

$$L = \frac{\Phi_M}{I} = \mu_0 n^2 (Aw)$$

$$u_E = \frac{B^2}{2\mu_0} \qquad B = \mu_0 n I$$

$$U_E = \frac{B^2}{2\mu_0} (Aw)$$

$$U = \frac{1}{2} L I^2$$



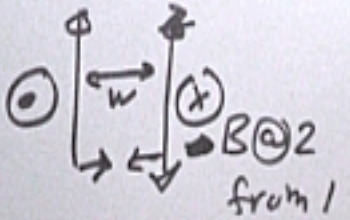
$$\phi = xwB$$

$$\mathcal{E} = -\frac{d\phi_M}{dt} = -BVw$$

$$|\mathcal{E}| = BVw$$

R: $$I = \frac{\mathcal{E}}{R} = \frac{BVw}{R}$$

1 2



$$\bar{F} = I\bar{L} \times \bar{B}$$

$$F = I_2 L \left(\frac{\mu_0 I_1}{2\pi w} \right)$$