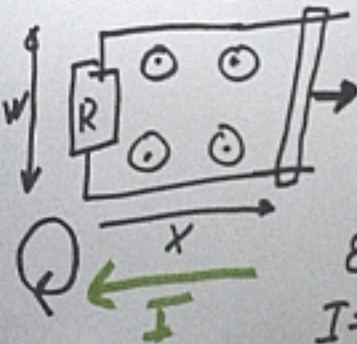
$$\Phi_M = \varepsilon \vec{B} \cdot \vec{A}$$

$$\mathcal{E} = -\frac{\Delta \Phi_M}{\Delta t}$$

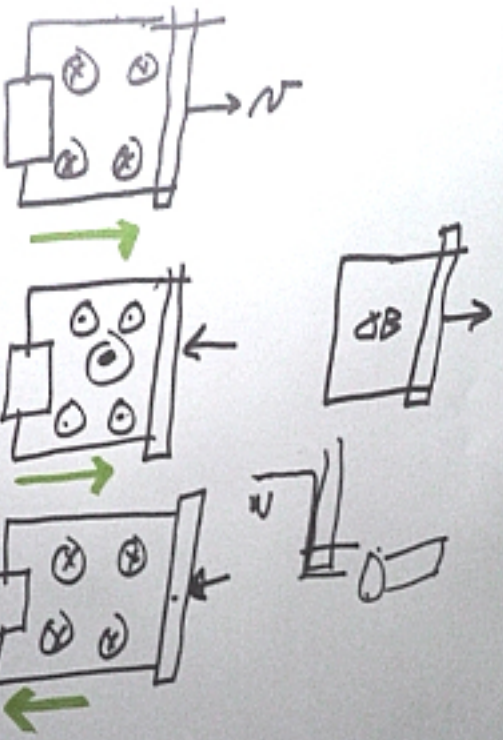
$\Phi_M = BWx$



$$\frac{\Delta \Phi_M}{\Delta t} = Bvw$$

$$\mathcal{E} = -Bvw$$

$$I = \frac{\mathcal{E}}{R} = -\frac{Bvw}{R}$$


N
dB
V

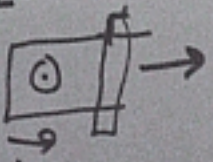
$$x = \frac{1}{2}at^2$$

$$\frac{\Delta x}{\Delta t} = at$$

$$\phi_M = BWx$$

$$\frac{\Delta \phi_M}{\Delta t} = BW(at)$$

$$\mathcal{E} = -BW(at)$$

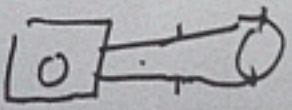


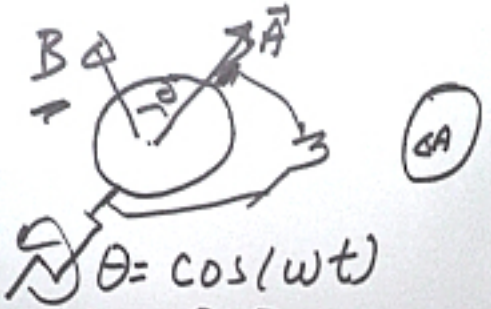
$\theta = \cos(\omega t)$

$\Phi_M = \vec{B} \cdot \vec{A} = BA\cos(\omega t)$

$\frac{\Delta \Phi_M}{\Delta t} = BA\left[-\omega \sin(\omega t)\right]$ ← calculus magic

$\mathcal{E} = \omega BA \sin(\omega t)$





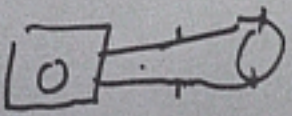
$\theta = \cos(\omega t)$

$\Phi_M = \vec{B} \cdot \vec{A} = BA\cos(\omega t)$

calculus magic

$\frac{\Delta \Phi_M}{\Delta t} = BA\left[-\omega \sin(\omega t)\right]$

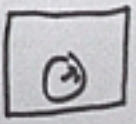
$\mathcal{E} = \omega BA \sin(\omega t)$



$$L \equiv \frac{\Phi_M}{I} \qquad \frac{Tm^2}{A} \qquad \frac{V}{(A/s)}$$

$$1H = \frac{1Tm^2}{1A}$$

L?



$$L = \frac{\Delta\Phi_M/\Delta t}{\Delta I/\Delta t}$$

$I = bt$

$\frac{\Delta I}{\Delta t} = b$

$\frac{\Delta\Phi_M}{\Delta t} = -\varepsilon$ $\quad L = \left|\frac{-\varepsilon}{b}\right|$

$$B = \mu_0 n I$$

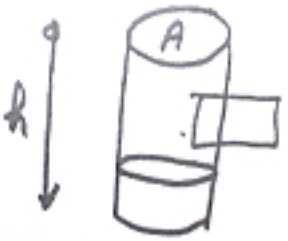
$$\Phi_{M,1} = \underset{(1\ \text{turn})}{\Phi_M} = \mu_0 n I A$$

$$\Phi_M = N \Phi_{M,1}$$

$$= \mu_0 n N I A \qquad \text{Vol}$$

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

$$L = \mu_0 n^2 (\text{vol})$$



I:

$$B = \mu_0 n I$$

$$\Phi_{M,1} = \underset{(1\ \text{turn})}{\Phi_M} = \mu_0 n I A$$

$$\Phi_M = N \Phi_{M,1}$$

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

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

$$L = \mu_0 n^2 (\text{vol})$$

Power

$\mathcal{E} = -\frac{\Delta}{\Delta t}\Phi_M$

$L = \mu_0 n^2 (Vol)$

$L = \frac{\Phi_M}{I} \Rightarrow I = \frac{\Phi_M}{L}$

Power $= IV$

$= I\mathcal{E} = I\left(\frac{\Delta \Phi_M}{\Delta t}\right)$

$= I \cdot \Delta I L$

$U = P \cdot \Delta t$

Max Energy stored $U_M = \frac{1}{2} L I^2$