

220

$\Delta + yB \cdot lT$

\odot

F

$L = 3\text{ m}, I = 2\text{ A}$

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

$$|\vec{F}| = (2 \times 3) \times (.1)$$

\otimes $= .6\text{ N}$

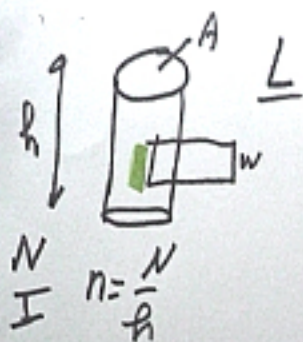
\odot $B = \frac{N}{Am}$

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

$$V = \frac{B \cdot m^2}{s}$$

$$\frac{J}{m} = \frac{F \cdot m}{m} = F$$

$$B = \frac{Vs}{m^2} \cdot \frac{A}{s} \cdot m$$



$$\sum \vec{B} \cdot \Delta \vec{S}_i = \mu_0 I_c$$

$$Bw = \mu_0 I (\eta \cdot w)$$

$$B = \mu_0 I \eta$$

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

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

$$\Phi_{M,1} = BA = \mu_0 I \eta \cdot A$$

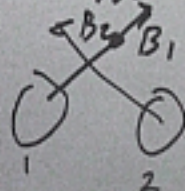
$$\Rightarrow \Phi = \mu_0 \eta^2 I (A w L)$$

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

$$U_M = \frac{1}{2} L I^2 = \frac{1}{2} \mu_0 n^2 (\text{Vol}) \times \left(\frac{B^2}{\mu_0 n^2} \right)$$

$$U_M = \frac{B^2}{2\mu_0} (\text{Vol})$$

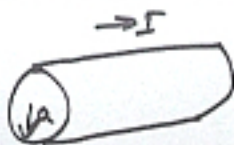
$$u_M = \frac{U_M}{\text{Vol}} = \frac{B^2}{2\mu_0} \quad u_E = \frac{1}{2} \epsilon_0 E^2$$



~~$$u_1 + u_2 ?$$~~

$$\vec{B} = (\vec{B}_1 + \vec{B}_2)$$

$$+ 2\vec{B}_1 \cdot \vec{B}_2$$



$$L = \frac{\Phi_M}{I} \quad \Phi_M \approx \int B A$$

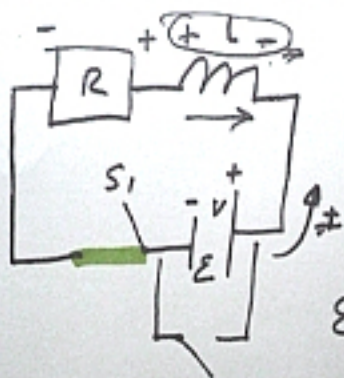
(1) $\oint \vec{B}_i \cdot d\vec{s}_i = \mu_0 I_c$

$$I_c = \frac{I}{\pi a^2} \cdot \pi r^2 = I \left(\frac{r^2}{a^2} \right)$$

(2) $B(2\pi r) = \mu_0 I \left(\frac{r^2}{a^2} \right)$

$$B = \mu_0 I \frac{r}{2\pi a^2}$$

$$\Phi_M = \int \vec{B}_i \cdot d\vec{A}_i \quad L = \frac{\Phi_M}{I}$$



$$I = \frac{\epsilon}{R}$$

$$\epsilon = - \frac{\Delta \phi_M}{\Delta t}$$

$$V_L = -L \frac{\Delta I}{\Delta t}$$

$$V - IR + V_L = 0$$

$$V - IR + V_L = 0$$

$$V - IR - L \frac{\Delta I}{\Delta t} = 0 \quad \div R$$

$$X = \frac{V}{R} - I$$

$$X + \frac{L}{R} \frac{\Delta X}{\Delta t} = 0$$

$$\tau = \frac{L}{R}$$

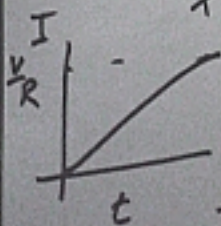
$$L = \frac{V}{A/S}$$

$$R = \frac{V}{A}$$

$$\frac{\frac{V}{A/S}}{V/A} = \frac{L}{R} = \tau$$

$$\tau_c = R \cdot C$$

$$X + \tau \frac{\Delta X}{\Delta t} = 0 \Rightarrow X = -\tau \frac{\Delta X}{\Delta t}$$

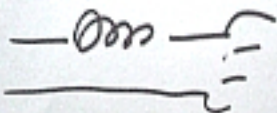


$$\frac{\Delta X}{X} = -\frac{\Delta t}{\tau}$$

$$X = X_0 e^{-t/\tau}$$

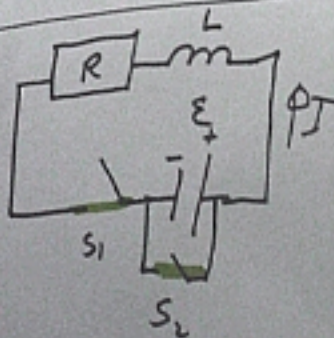
$$\ln\left(\frac{X}{X_0}\right) = -\frac{t}{\tau}$$

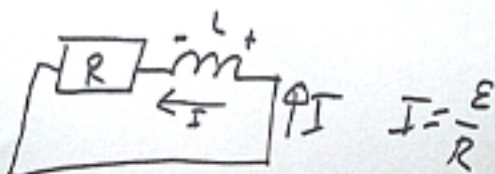
$$I = \frac{V}{R} (1 - e^{-t/\tau})$$



$$I(t) = \frac{V}{R} (1 - e^{-t/\tau})$$

$$\tau = \frac{L}{R}$$





$$V_L = -L \frac{\Delta I}{\Delta t}$$

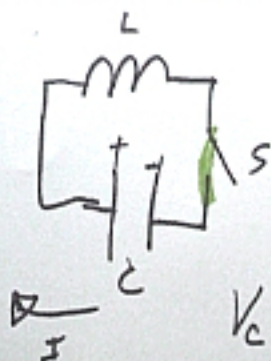
$$\therefore L \frac{\Delta I}{\Delta t} - IR = 0$$

$$\frac{\Delta I}{\Delta t} = -I/\tau$$

$$\frac{\Delta I}{I} = -\frac{\Delta t}{\tau}$$

$$\ln\left(\frac{I}{I_0}\right) = -\frac{t}{\tau} \Rightarrow I = I_0 e^{-t/\tau}$$

$$U_m = \frac{1}{2} LI^2$$



$$C = \frac{Q}{V} \quad V_C = \frac{Q}{C}$$

$$V = -L \frac{\Delta I}{\Delta t}$$

$$V_C - V_L = 0$$

$$\frac{Q}{C} + L \frac{\Delta I}{\Delta t} = 0$$

$$I(t) = I_m \sin(\omega t + \phi)$$

$$\omega = \frac{1}{\sqrt{LC}}$$

$$Q(t) = -\frac{I_m C \omega}{\omega} \cos(\omega t + \phi)$$

A hand-drawn diagram illustrating the addition of two rectangular blocks. The first block is green and labeled u_M . The second block is purple and labeled u_e . An equals sign follows, leading to a white rectangular block labeled U .

$$\omega = \frac{1}{\sqrt{LC}}$$