$$\vec{F} = q(\vec{E} + \vec{v} \times \vec{B})$$

$$c = \frac{1}{\sqrt{\epsilon_0 \mu_0}}$$

$$d\vec{F} = I\, d\vec{\ell} \times \vec{B}$$

$$u = \frac{1}{2}\epsilon_0 E^2 + \frac{1}{2}B^2/\mu_0$$

$$F = I \ell B \sin\theta$$

$$P = 2\bar{S}/c$$

$$\vec{\tau} = \vec{\mu} \times \vec{B} = N I \vec{A} \times \vec{B}$$

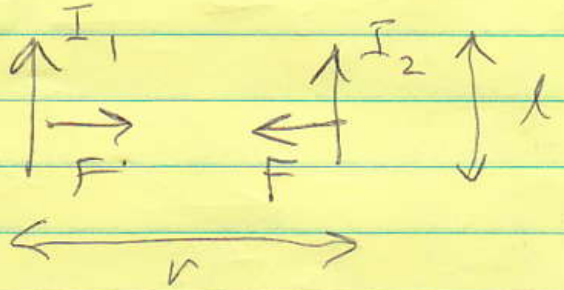
$$\vec{S} = \frac{1}{\mu_0} \vec{E} \times \vec{B}$$

$$\bar{S} = E_{rms} B_{rms}/\mu_0$$

Ampere $\quad B = \dfrac{\mu_0 I}{2\pi r}$ $\qquad \oint \vec{B} \cdot d\vec{\ell} = \mu_0 I_{enc\ell} + \mu_0 \epsilon_0 \dfrac{d\Phi_E}{dt}$

$$d\vec{B} = \frac{\mu_0 I}{4\pi} \frac{d\vec{\ell} \times \vec{r}}{r^3} \qquad \frac{\hat{r}}{r^2} = \frac{\vec{r}}{r^3}$$

$$F = \frac{\mu_0 I_1 I_2 \ell}{2\pi r}$$



$$\mathcal{E} = -N \frac{d\Phi_B}{dt} \qquad \mathcal{E} = B\ell v \text{ special case}$$

$$\oint \vec{E} \cdot d\vec{l} = -\frac{d\Phi_B}{dt}$$

$$M = \frac{N_2 \Phi_{21}}{I_1} \quad \begin{matrix} \text{coil 2} \\ \text{field from } I_1 \end{matrix} = \frac{N_1 \Phi_{12}}{I_2}$$

$$\mathcal{E}_i = -M \frac{dI_j}{dt} \qquad L = \frac{N \Phi_B}{I}$$