

$$\mu_0 = 4\pi \times 10^{-7}$$

$$\epsilon_0 = 8.85 \times 10^{-12}$$

$$\Phi_B = \int \vec{B} \cdot d\vec{A}$$

$$\Phi_E = \int \vec{E} \cdot d\vec{A}$$

$$\vec{F} = q \vec{v} \times \vec{B}$$

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

$$\vec{\tau} = \vec{\mu} \times \vec{B}$$

$$\oint \vec{B} \cdot d\vec{l} = \mu_0 I_{\text{enclosed}}$$

$$\vec{B} = \frac{\mu_0}{4\pi} \frac{q \vec{v} \times \hat{r}}{r^2}$$

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

$$B = \frac{\mu_0 I}{2\pi r} ; B = \frac{\mu_0 N I}{2\pi r} ; B = \mu_0 n I$$

$$B_x = \frac{\mu_0 I a^2}{2(x^2 + a^2)^{3/2}}$$

$$B = \frac{\mu_0 I r_2}{2\pi R^2}$$

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

$$i_D = \epsilon \frac{d\Phi_E}{dt}$$