Formulas:

$$div\vec{E} = \frac{\rho}{\varepsilon_0}\,;\, \vec{F}_B = q\vec{\mathrm{v}} \times \vec{B}$$

$$d\vec{F}_B = I\left(d\vec{s} \times \vec{B}\right)$$

$\vec{\mu} = I\vec{A} =$ magnetic dipole moment

$$U_B = -\vec{\mu} \cdot \vec{B}\,;\, \vec{\tau}_B = \vec{\mu} \times \vec{B}$$

$$curl\vec{B} = \mu_0 \vec{j}$$

$$d\vec{B} = \frac{\mu_0 I}{4\pi}\frac{d\vec{s} \times \vec{r}}{r^3} = \frac{\mu_0 I}{4\pi}\frac{d\vec{s} \times \vec{u}_r}{r^2}\,;\, \frac{\mu_0}{4\pi} = 10^{-7}$$

$$curl\vec{B} = \mu_0\left(\vec{j} + \underbrace{\varepsilon_0 \frac{\partial \vec{E}}{\partial t}}_{\vec{j}_d}\right)$$

$$\vec{\nabla} \times \vec{E} = -\frac{\partial \vec{B}}{\partial t}\;\; \varepsilon = -N\frac{d\Phi_B}{dt}$$

$$\varepsilon = -\frac{d}{dt}\left(\vec{B} \cdot \vec{A}\right) = -\frac{d}{dt}\left(BA\cos\theta\right) = -\frac{d}{dt}\left(BA\cos\omega t\right) = BA\omega\sin\omega t$$

$$\varepsilon_L = -N\frac{d\Phi_B}{dt} = -L\frac{dI}{dt}$$

$$L = \frac{N\Phi_B}{I}$$

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

$$u_E = \frac{1}{2}\varepsilon_0 E^2\,;\, u_B = \frac{B^2}{2\mu_0}$$

$$\hat{I}(t) = \frac{\hat{V}(t)}{\hat{z}_{eq}};\, I_{rms} = \frac{I_{\max}}{\sqrt{2}};\, V_{rms} = \frac{V_{\max}}{\sqrt{2}}$$

$$\hat{Z}_L = i\omega L \Rightarrow \hat{I}(t) = \frac{\hat{V}(t)}{i\omega L};\, I_{\max} = \frac{V_{\max}}{\omega L}$$

$$\hat{Z}_C = \frac{1}{i\omega C} \Rightarrow \hat{I}(t) = i\omega C\hat{V}(t);\, I_{\max} = \omega C V_{\max}$$

$$P = \hat{V}_{rms}\hat{I}_{rms}\cos\Phi$$