\[ \rho = \rho_0 + \alpha \varepsilon - T_0 \varepsilon - \nabla \cdot \rho \]
\[ R = \rho \frac{l}{A} \]
\[ \rho \vec{j} = \vec{E} \]
\[ V = IR \quad P = IV \quad U = \frac{CV^2}{2} \quad C = \frac{Q}{V} \quad \sigma = \frac{1}{\rho} \]
\[ R = R_1 + R_2 + R_3 \]
\[ \frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} \]
\[ I = \int \vec{j} \cdot d\vec{A} \]
\[ \sum I_R = \sum V \quad \sum I = 0 \]
\[ q = C \varepsilon (1 - e^{-t/\tau}) \quad \tau = RC \quad I = \frac{dQ}{dt} = \frac{\varepsilon}{R} e^{-t/\tau} \]
\[ \vec{F} = q\vec{v} \times \vec{B} \quad F = I\vec{l} \times \vec{B} \quad \vec{\tau} = \vec{\mu} \times \vec{B} \quad \vec{\mu} = NI\vec{A} \quad qvB = m\frac{v^2}{r} \]
\[ B = \frac{\mu_0 I}{2\pi r} \quad F = \frac{\mu_0 I_1 I_2 L}{2\pi r} \quad B = \int \vec{B} \cdot d\vec{l} = \mu_0 I_{encl} \]
\[ BL = \mu_0 NI \quad B = \frac{\mu_0 NI}{2\pi r} \]
\[ B_{loop} = \frac{\mu_0 NI}{2a} \quad d\vec{B} = \frac{\mu_0 I d\vec{l} \times \vec{r}}{4\pi r^2} \quad B = \frac{\mu_0 I a^2}{2 \left( \rho^2 + a^2 \right)^{3/2}} \]
\[ e = 1.6 \times 10^{-19} \, C \]
\[ m_e = 9.11 \times 10^{-31} \, Kg \]
\[ m_p = 1.67 \times 10^{-27} \, Kg = 1 \text{ amu} \]
\[ \mu_0 = 4\pi \times 10^{-7} \, T - m / A \]