

Equations

$$F = \frac{k|q_1||q_2|}{r^2}$$

$$\vec{E} = \frac{\vec{F}}{q_o}$$

$$\Phi = EA\cos\theta$$

$$\Phi = \frac{q}{\epsilon_o}$$

$$\Delta V = \frac{\Delta U}{q_o} = \frac{-W}{q_o}$$

$$E = \frac{-\Delta V}{\Delta s}$$

$$V = \frac{kq}{r}$$

$$U = \frac{kq_o q}{r}$$

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

$$C = \frac{\kappa\epsilon_o A}{d}$$

$$U = \frac{1}{2}CV^2$$

$$I = \frac{\Delta Q}{\Delta t}$$

$$V = IR$$

$$R = \frac{\rho L}{A}$$

$$P = IV$$

$$\tau = RC$$

$$q(t) = Q(1 - e^{-t/\tau})$$

$$q(t) = Qe^{-t/\tau}$$

Constants

$$e = 1.60 \times 10^{-19} \text{C}$$

$$k = 8.99 \times 10^9 \text{ Nm}^2/\text{C}^2$$

$$\epsilon_o = 8.85 \times 10^{-12} \text{ C}^2/(\text{Nm}^2)$$

$$1\text{eV} = 1.60 \times 10^{-19} \text{J}$$

$$m_e = 9.11 \times 10^{-31} \text{kg}$$

$$m_p = 1.67 \times 10^{-27} \text{kg}$$