

Physics NYB Equation Sheet

$F = k \frac{ q_1 q_2 }{r^2}$ $E = k \frac{ Q }{r^2}$ $\mathbf{E} = \frac{\mathbf{F}}{q}$ $\Delta V = \frac{\Delta PE}{q}$ $V = k \frac{Q}{r}$ $E = -\frac{\Delta V}{\Delta s}$ $I = \frac{\Delta Q}{\Delta t}$ $I = nqAv_d$ $V = IR$ $R = \frac{\rho L}{A}$	$\rho = \rho_0(1 + \alpha \Delta T)$ $R_S = R_1 + R_2 + R_3 \dots$ $\frac{1}{R_P} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} \dots$ $P = VI = I^2 R = \frac{V^2}{R}$ $C = \frac{Q}{V}$ $C = \frac{\epsilon_0 A}{d}$ $C = \kappa \frac{\epsilon_0 A}{d}$ $\frac{1}{C_S} = \frac{1}{C_1} + \frac{1}{C_2} + \frac{1}{C_3} \dots$ $C_P = C_1 + C_2 + C_3 \dots$ $E_{cap} = \frac{1}{2} QV = \frac{1}{2} CV^2$ $= \frac{Q^2}{2C}$ $\tau = RC$ $V = emf (1 - e^{-t/RC})$ $V = V_0 e^{-t/RC}$	$F = qvB \sin \theta$ $F = IlB \sin \theta$ $r = \frac{mv}{qB}$ $\tau = NIAB \sin \theta$ $B = \frac{\mu_0 I}{2\pi r}$ $B = \frac{\mu_0 NI}{2R}$ $B = \mu_0 nI$ $\Phi = BA \cos \theta$ $emf = -N \frac{\Delta \Phi_B}{\Delta t}$ $\epsilon = vB\ell$
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Some useful constants

$k = \frac{1}{4\pi\epsilon_0} = 8.99 \times 10^9 \frac{\text{N} \cdot \text{m}^2}{\text{C}^2}$ $ q_e = 1.60 \times 10^{-19} \text{C}$ $m_e = 9.11 \times 10^{-31} \text{kg}$ $m_p = m_n = 1.67 \times 10^{-27} \text{kg}$	$\epsilon_0 = 8.85 \times 10^{-12} \frac{\text{C}^2}{\text{N} \cdot \text{m}^2}$ $\mu_0 = 4\pi \cdot 10^{-7} \frac{\text{N}}{\text{A}^2} \text{ or } \frac{\text{Wb}}{\text{A} \cdot \text{m}}$ $g = 9.81 \frac{\text{m}}{\text{s}^2}$
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