

PHYS 202 Spring 2002 Formula Sheet for Exam I

circumference of circle = $2\pi r$ area of circle = πr^2
area of cylinder = $2\pi r l + 2\pi r^2$ volume of cylinder = $\pi r^2 l$
area of sphere = $4\pi r^2$ volume of sphere = $\frac{4}{3}\pi r^3$
mass of electron $m_e = 9.11 \times 10^{-31}$ kg mass of proton $m_p = 1.67 \times 10^{-27}$ kg
 $e = 1.60 \times 10^{-19}$ C 1 eV = 1.60×10^{-19} J

$$k = 1/4\pi\epsilon_0 = 8.99 \times 10^9 \text{ N}\cdot\text{m}^2/\text{C}^2 \quad \epsilon_0 = 8.85 \times 10^{-12} \text{ C}^2/\text{N}\cdot\text{m}^2$$

$$F = k|q_1 q_2|/r^2 \quad \mathbf{E} = \mathbf{F}/q_0 \quad E = k|q|/r^2 \quad E = \sigma/\epsilon_0$$

$$\Phi_E = \sum (E \cos \phi) \Delta A = Q/\epsilon_0$$

$$W_{AB} = \text{EPE}_A - \text{EPE}_B \quad V = \text{EPE}/q_0 \quad \Delta V = \Delta(\text{EPE})/q_0 = -W_{AB}/q_0$$

$$V = kq/r$$

$$q = CV \quad \kappa = E_0/E \quad C = \kappa\epsilon_0 A/d$$

$$\text{Energy} = \frac{1}{2}CV^2 \quad \text{Energy density} = \frac{1}{2}\kappa\epsilon_0 E^2$$