

Physics Equations/Notes - 2/26/13 www.askmath.weebly.com

• Kinematics

$$v = v_0 + at \quad (1)$$

$$d = d_0 + \frac{1}{2}(v + v_0) \cdot t \quad (2)$$

$$d = d_0 + v_0t + \frac{1}{2}at^2 \quad (3)$$

$$v^2 = v_0^2 + 2ad \quad (4)$$

$$v = \frac{\Delta d}{\Delta t} \quad (5)$$

• Forces

$$\vec{a} = \frac{\vec{F}_{\text{net}}}{m} \quad (1)$$

$$F_{\text{f, kinetic}} = \mu_k F_N \quad (2)$$

$$0 \leq F_{\text{f, static}} \leq \mu_s F_N \quad (3)$$

$$T = 2\pi\sqrt{\frac{l}{g}} \quad (4)$$

$$F_{\text{A on B}} = -F_{\text{B on A}} \quad (5)$$

• Centripetal Motion

$$a_c = \frac{v^2}{r} \quad (1)$$

$$F_{\text{net}} = ma_c \quad (2)$$

• Universal Gravitation

$$\left(\frac{T_A}{T_B}\right)^2 = \left(\frac{r_A}{r_B}\right)^3 \quad (1)$$

$$F = G \times \frac{m_A m_B}{d^2} \quad (2)$$

$$T^2 = \left(\frac{4\pi^2}{Gm_S}\right) \cdot r^3 \quad (3)$$

$$v = \sqrt{\frac{Gm_E}{r}} \quad (4)$$

$$T = 2\pi\sqrt{\frac{r^3}{Gm_E}} \quad (5)$$

$$\vec{g} = \frac{\vec{F}}{m} \quad (6)$$

• Momentum and Impulse www.askmath.weebly.com

$$\vec{J} = \vec{F}\Delta t \quad (1)$$

$$J = \Delta p \quad (2)$$

$$p = m\vec{v} \quad (3)$$

$$\vec{F}\Delta t = m\Delta\vec{v} \quad (4)$$

$$p_{a1} + p_{b1} = p_{a2} + p_{b2} \quad (5)$$

• Energy and Work

$$k = \frac{1}{2}mv^2 \quad (1)$$

$$W = F \cdot d \quad (2)$$

$$\Delta K = W \quad (3)$$

$$W = Fd \cdot \cos\theta \quad (4)$$

$$P = \frac{W}{t} \quad (5)$$

$$MA = \frac{F_r}{F_e} \quad (6)$$

$$IMA = \frac{d_e}{d_r} \quad (7)$$

$$\text{efficiency} = \frac{W_o}{W_i} \times 100 \quad (8)$$

$$\text{efficiency} = \frac{MA}{IMA} \times 100 \quad (9)$$

• Energy

$$U_g = mgh \quad (1)$$

$$E = K + U_g \quad (2)$$

$$K_{\text{before}} + U_{g \text{ before}} = K_{\text{after}} + U_{g \text{ after}} \quad (3)$$

• Thermal Energy

$$Q = mC\Delta T \quad (1)$$

$$E_A + E_B = \text{constant} \quad (2)$$

$$Q = m \cdot H_f \quad (3)$$

$$Q = m \cdot H_v \quad (4)$$

$$\alpha = \frac{\Delta L}{L_1 \cdot \Delta T} \quad (5)$$

• Sound www.askmath.weebly.com

$$\lambda_n = \frac{4L}{n}, \text{ for odd } n \quad (1)$$

$$f_n = n \frac{v}{4L}, \text{ for odd } n \quad (2)$$

$$\lambda_n = \frac{2L}{n}, \text{ for even } n \quad (3)$$

$$f_n = n \frac{v}{2L}, \text{ for even } n \quad (4)$$

$$\Delta L = \frac{1}{2} \lambda \quad (5)$$

$$\text{Doppler Effect: } f_D = f_S \times \frac{v \pm v_D}{v \mp v_S} \quad (6)$$

• Light

$$E = \frac{P}{4\pi d^2} \quad (1)$$

$$E = \frac{I}{r^2} \quad (2)$$

• Mirror and Lenses

$$n_i \sin \theta_i = n_r \sin \theta_r \quad (1)$$

$$n = \frac{c}{v} \quad (2)$$

$$\frac{1}{f} = \frac{1}{d_i} + \frac{1}{d_o} \quad (3)$$

$$m = \frac{h_i}{h_o} = -\frac{d_i}{d_o} \quad (4)$$

• Diffraction of Light

$$\lambda = \frac{x \cdot d}{L} \quad (1)$$

$$\lambda = d \sin \theta \quad (2)$$

• Static Electricity

$$F = K \cdot \frac{q_A \cdot q_B}{d^2} \quad (1)$$