Formula Sheet

$$s_f = s_i + v_i \Delta t + \frac{1}{2} a \Delta t^2 \qquad {v_f}^2 = {v_i}^2 + 2a\Delta x \qquad g = 9.8\ m/s^2$$

$$a_c = \frac{v_t^2}{r} = r\omega^2 \qquad v_t = r\omega \qquad a_t = r\alpha$$

$$\theta_f = \theta_i + \omega_i \Delta t + \frac{1}{2}\alpha \Delta t^2 \qquad T = \frac{2\pi r}{v}$$

$$T = \frac{2\pi}{|\omega|}\ OR\ \frac{1}{|\omega|}\ OR\ \frac{360}{|\omega|}$$

$$F_G = \frac{GMm}{r^2} \qquad G = 6.67x10^{-11}\ m^3 kg^{-1} s^{-2}$$

Mass of Earth: 5.97 x 10^{24}kg *Radius of Earth: 6371 km*

$$f_{smax} = \mu_s n \qquad f_k = \mu_k n$$

$$\vec{p} = m\vec{v} \qquad \vec{F} = \frac{d\vec{p}}{dt}$$

$$J_c = \int_{t_i}^{t_f} F_x(t)dt \qquad J_x = \Delta p_x \qquad \vec{J} = \Delta\vec{p}$$

$$KE = \frac{1}{2}mv^2 \qquad U_{spring} = \frac{1}{2}k\Delta s^2 \quad U_g = mgy$$

Elastic collision eq:

$$v_{1f} = \frac{m_1 - m_2}{m_1 + m_2} v_{1i} \qquad v_{2f} = \frac{2m_1}{m_1 + m_2} v_{1i}$$

$$\Delta K + \Delta U + \Delta E_{th} = W_{ext} = \Delta E_{sys}$$

$$K_i + U_i + W_{ext} = K_f + U_f + \Delta E_{th}$$

$$\Delta K = W_{net}$$

$$W_c = -\Delta U \qquad W_{diss} = -\Delta E_{th}$$

$$W = \int_{s_i}^{s_f} F_s ds \qquad W = \vec{F} \cdot \Delta\vec{r}$$

$$P = \frac{dE_{sys}}{dt} \qquad P = \vec{F} \cdot \vec{v} \qquad F_s = \frac{-dU}{ds}$$

$$\vec{A} \cdot \vec{B} = AB\cos\theta = A_x B_x + A_y B_y$$