Physics NYA Equation Sheet

$$\bar{v} = \frac{\Delta x}{\Delta t}$$

$$\bar{a} = \frac{\Delta v}{\Delta t}$$

$$v = v_o + at$$

$$v^2 = {v_o}^2 + 2a(x - x_o)$$

$$x = x_o + v_o t + \frac{1}{2}at^2$$

$$x = x_o + \bar{v}t$$

$$\bar{v} = \frac{v_o + v}{2}$$

$$s = r\theta$$

$$v_t = r\omega$$

$$a_t = r\alpha$$

$$a_c = \frac{{v_t}^2}{r}$$

$$\theta_f = \theta_o + \omega t$$

$$\omega_f = \omega_o + \alpha t$$

$$\theta_f = \theta_o + \omega_o t + \frac{1}{2}\alpha t^2$$

$${\omega_f}^2 = {\omega_o}^2 + 2\alpha(\Delta\theta)$$

$$\vec{\boldsymbol{F}}_{net} = \Sigma\vec{\boldsymbol{F}} = \mathrm{m}\vec{\mathbf{a}}$$

$$w = mg$$

$$f_k = \mu_k N$$

$$f_s \leq \mu_s N$$

$$\vec{\boldsymbol{\tau}} = \vec{\boldsymbol{r}} \times \vec{\boldsymbol{F}}$$

$$\vec{\boldsymbol{\tau}}_{\boldsymbol{net}} = \Sigma\vec{\boldsymbol{\tau}} = \mathrm{I}\vec{\boldsymbol{\alpha}}$$

$$I = \Sigma m_j r_j^2$$

$$W = \int \vec{\boldsymbol{F}}\, d\vec{\boldsymbol{r}} = \vec{\boldsymbol{F}} \cdot \vec{\boldsymbol{d}}$$

$$K = \frac{1}{2}mv^2$$

$$K_{rot} = \frac{1}{2}I\omega^2$$

$$W_{net} = K_B - K_A$$

$$W_{nc} = \Delta K + \Delta U$$

$$P_{ave} = \frac{\Delta W}{\Delta t}$$

$$U_{grav} = mgh$$

$$U_{elastic} = \frac{1}{2}kx^2$$

$$\vec{\boldsymbol{F}} = -k\vec{\boldsymbol{x}}$$

$$\vec{\boldsymbol{p}} = m\vec{\boldsymbol{v}}$$

$$\vec{\boldsymbol{p}}_{\mathbf{1}} + \vec{\boldsymbol{p}}_{\mathbf{2}} + \ \ldots = constant$$

$$\vec{\boldsymbol{J}} = \int_{t_i}^{t_f} \vec{\boldsymbol{F}}\, dt = \Delta\vec{\boldsymbol{p}}$$

$$F_g = G\frac{m_1 m_2}{r^2}$$

$$G = 6.67x10^{-11}\frac{Nm^2}{kg^2}$$

$$g = 9.81\frac{N}{kg} = 9.81\frac{m}{s^2}$$