

Physics NYA Equation Sheet

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

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

$$v = v_o + at$$

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

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

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

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

$$s = r\theta$$

$$v = r\omega$$

$$a_t = r\alpha$$

$$a_c = \frac{v^2}{r} = \omega^2 r$$

$$\bar{\omega} = \frac{\Delta \theta}{\Delta t}$$

$$\bar{\alpha} = \frac{\Delta \omega}{\Delta t}$$

$$\omega = \omega_o + \alpha t$$

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

$$\omega^2 = \omega_o^2 + 2\alpha(\theta - \theta_o)$$

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

$$w = mg$$

$$f_k = \mu_k N$$

$$f_s \leq \mu_s N$$

$$\tau = rF \sin \theta$$

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

$$I = \Sigma mr^2$$

$$W = Fd \cos \theta$$

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

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

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

$$KE_i + PE_i + W_{nc} = KE_f + PE_f$$

$$P = \frac{W}{t}$$

$$PE_g = mgh$$

$$PE_s = \frac{1}{2}kx^2$$

$$F = -kx$$

$$\mathbf{p} = m\mathbf{v}$$

$$\Delta \mathbf{p} = \mathbf{F}_{net} \Delta t$$

$$\mathbf{p}_{tot} = constant = \mathbf{p}'_{tot}$$

$$F_g = G \frac{mM}{r^2}$$

$$G = 6.67 \times 10^{-11} \frac{Nm^2}{kg^2}$$

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