Formula sheet for common exam 2

DO NOT USE THIS SHEET DURING COMMON EXAM.

Use the copy that will be provided during the exam.

Use: $g = 10\ m/s^2$

Weight: $W = mg$ 360 degrees = 1 revolution

Newton's second law:

$$\mathbf{F}_{Net} = \Sigma\mathbf{F} = m\mathbf{a} \qquad \Sigma F_x = ma_x \qquad \Sigma F_y = ma_y$$

Friction forces:

$$0 < f_s < f_s^{max}; \qquad f_s^{max} = \mu_s N; \qquad f_k = \mu_k N$$

Accelerated motion in a straight line (1-D Motion):

$$v = v_o + a t; \quad x = v_o t + \tfrac{1}{2} a t^2; \quad 2a(x - x_o) = v^2 - v_o^2; \quad x = \tfrac{1}{2}(v + v_o) t$$

Circular motion:

$$F_r = ma_r; \quad a_r = v^2/r = r(2\pi/T)^2, \quad \text{period } T = 2\pi r/v, \quad f = 1/T,$$

Projectile motion (2-D Motion):

For θ measured from the +x axis: $v_{ox} = v_o\cos\theta$; $v_{oy} = v_o\sin\theta$;

$$x = v_{ox} t \quad y = v_{oy} t - 1/2\, g t^2; \quad v_y = v_{oy} - g t; \quad -2gy = v_y^2 - v_{oy}^2$$

Resistive force: (object moving through a liquid)

$$R = -bv$$

$$v_T = mg/b$$