Potentially useful numbers

Acceleration due to earth's gravity $g = 9.8\ m/s^2$

Linear kinematics in general

Velocity $v = \frac{ds}{dt}$

Acceleration $a = \frac{dv}{dt}$

Rotational kinematics in general

Angular velocity $\omega = \frac{d\theta}{dt}$

Angular acceleration $\alpha = \frac{d\omega}{dt}$

Radial acceleration $a_r = v_t^2/r = \omega^2 r$

Period $T = 2\pi r/v_t = 2\pi/\omega$

Kinematics with constant acceleration

$s_f = {}^1/_2\, at^2 + v_i t + s_i v_f = at + v_i$

$v_f = v_i + at$

$v_f^2 = v_i^2 + 2a\Delta s$

Projectile motion range
(for launch at same height as landing)

$$\Delta x = \frac{v_i^2 \sin 2\theta}{g}$$

Rotational kinematics (constant α)

Angular position $\theta = s/r$

$\theta_f = ½\, \alpha t^2 + \omega_i t + \theta_i$

Angular velocity $\omega = v_t/r$

$\omega_f = \alpha t + \omega_i$

$\omega_f^2 = \omega_i^2 + 2\alpha\Delta\theta$

Angular acceleration $\alpha = a_t/r$

Force Equations

Newton's second law	$\Sigma F = F_{net} = ma$
Weight	$W = mg$
Static friction	$f_s \le \mu_s N$
Kinetic and rolling friction	$f = \mu N$
Spring Force	$F_{sp} = -k(s - s_{eq})$
Drag	$D \approx ¼\, Av^2$

Miscellaneous useful equations

Relative motion $v = v' + V$

Area of a circle $Area = \pi r^2$

Quadratic equation

$$ax^2 + bx + c = 0$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Trig and vector basics

$$\sin\theta = \frac{opposite}{hypotenuse}$$

$$\cos\theta = \frac{adjacent}{hypotenuse}$$

$$\tan\theta = \frac{opposite}{adjacent}$$

$$\vec{\mathbf{C}} = \vec{\mathbf{A}} + \vec{\mathbf{B}}$$

$$C_x = A_x + B_x$$

$$C_y = A_y + B_y$$

$$|\vec{\mathbf{C}}| = \sqrt{C_x^2 + C_y^2}$$

$$\theta = \tan^{-1}\left(\frac{C_y}{C_x}\right)$$