

1 Formulas for Midterm Exam 1 (Physics 125)

One dimensional motion in x

$$x = x_0 + v_0t + \frac{1}{2}at^2 \quad (1)$$

$$v = v_0 + at \quad (2)$$

$$v^2 = v_0^2 + 2a(x - x_0) \quad (3)$$

Projectile Motion

x	y
$x = x_0 + v_{0x}t$	$y = y_0 + v_{0y}t - \frac{1}{2}gt^2$
$v_x = v_{0x}$	$v_y = v_{0y} - gt$
$v_x^2 = v_{0x}^2$	$v_y^2 = v_{0y}^2 - 2g(y - y_0)$

Relative velocity

$$\vec{v}_{P/B} = \vec{v}_{P/A} + \vec{v}_{A/B} \quad (4)$$

Forces

$$\Sigma \vec{F} = m\vec{a} \quad (5)$$

$$\vec{w} = m\vec{g}, \quad (6)$$

$$f_s \leq \mu_s n, \quad (7)$$

$$f_k = \mu_k n. \quad (8)$$

Circular Motion

$$a_{\text{rad}} = \frac{v^2}{R} \quad (9)$$