Physics 200
Semester 1 Formulas, 2017-2018

d=rt [zero acceleration]

Good Stuff for Constant Acceleration

$$\Delta x = v_{x0}t + \frac{1}{2}at^2$$

$$\Delta x = \frac{1}{2}(v_{x0} + v_x)t$$

$$v_x = v_{x0} + at$$

$$v_x^2 = v_{x0}^2 + 2a(x - x_0)$$

**During freefall, a = g, and y may be substituted for x.

Good Stuff for Free Fall

$$\Delta y = v_{y0}t - \frac{1}{2}gt^2$$

$$\Delta y = \frac{1}{2}(v_{y0} + v_y)t$$

$$v_y = v_{y0} - gt$$

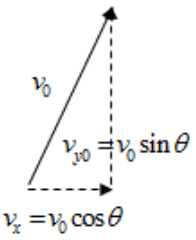
$$v_y^2 = v_{y0}^2 - 2g(y - y_0)$$

Good Stuff

Resolving into x & y components:

Range formula:

$$Range = \frac{v_0^2 \sin 2\theta}{g}$$



Horizontal motion: $x = v_x t = v_0(\cos\theta)\,t$

Vertical Motion:

$$y = y_0 + v_{y0}t - \frac{1}{2}gt^2 = y_0 + v_0(\sin\theta)\,t - \frac{1}{2}gt^2$$

$$v_y = v_{y0} - gt = v_0 \sin\theta - gt$$

Formulas:

$\Delta x = x - x_0$

$v_{x\,Ave.} = \frac{\Delta x}{\Delta t}$

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

$\Delta x = \frac{1}{2}(v_{x0} + v_x)t$

$v_x = v_{x0} + at$

$\Delta x = v_{x0}\,t + \frac{1}{2}at^2$

$v_x^2 = v_{0x}^2 + 2a(\Delta x)$

$\sum F = F_{NET} = ma$

$w = mg$

$F_f = \mu F_N$

$g = 9.8\frac{m}{s^2}$

$a_{centripetal} = v^2/r$ $F_{centripetal} = mv^2/r$ $G = 6.67\text{x}10^{-11}\text{Nm}^2/\text{kg}^2$

$\boldsymbol{F_{gravity} = G\left(\frac{M_1 m_1}{r^2}\right)}$ $\frac{T_A^2}{T_B^2} = \frac{r_A^3}{r_B^3}$ Circumference = 2πr w=mg

W=Fd $P = \frac{W}{t}$ $W_{net} = \Delta KE$ $KE = \frac{1}{2}mv^2$ $\Delta PE = mgh$

$KE_{initial} + PE_{initial} = KE_{final} + PE_{final}$ $KE_{initial} + PE_{initial} + W_{nc} = KE_{final} + PE_{final}$

$PE_{spring} = \frac{1}{2}kx^2$ $F_{spring} = kx$