Reivew: Solving Projectile Motion Problems

$\Delta x = \frac{1}{2}at^2 + v_it$

$v_f = at + v_i$

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

$v_x = \Delta x/t$

$\Delta x_y = \frac{1}{2}at^2 + v_{iy}t$

$v_{fy} = at + v_{iy}$

$v_{fy}^2 = v_{iy}^2 + 2a\Delta x_y$

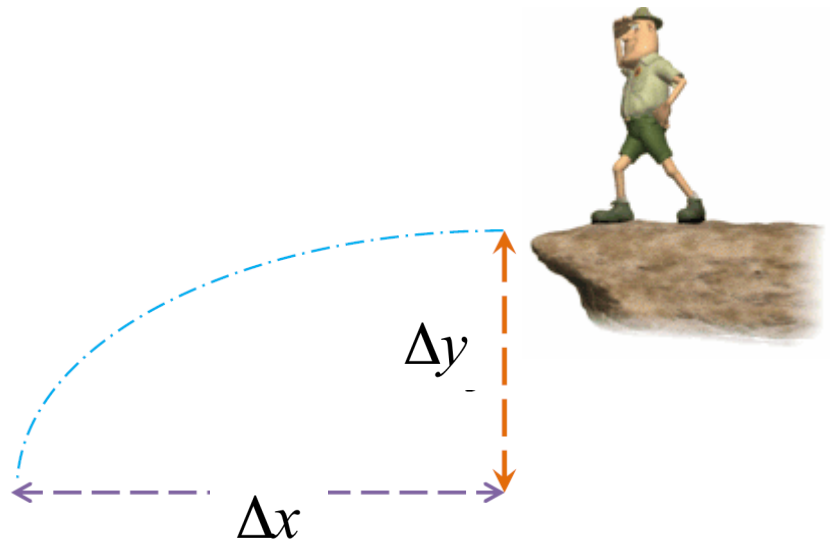| Variable	Name	Unit
Δx		
v_i		
v_f		
a		
t		
Δx_y		
v_{iy}		
v_{fy}		
g		

Examples:
1. A rock is thrown horizontally from the top of a cliff at 150 m/s.
   a) How long does it take the rock to fall 45 m vertically?

   b) Find the rock's vertical velocity at 45 meters.

   c) What was the rock's horizontal displacement after falling 45 m?

Δy

Δx

2. A baseball is thrown horizontally from a grandstand 20 m above the ground at a speed of 10 m/s.

    a) How long will the ball remain in flight before reaching the ground?

    b) What is the projectile's maximum range before it hits the ground?