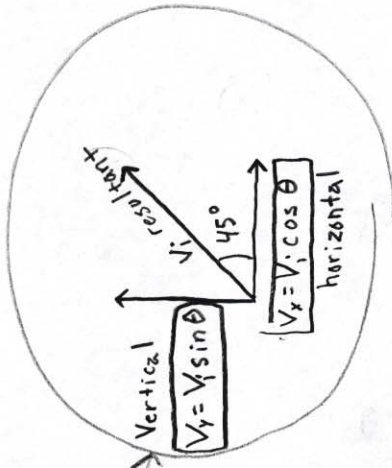


# Projectile Motion Anatomy



With time you can find the  $V_y$  or  $V_x$  at any height  $\Delta y$

can find the  $V_y$

$V_{yf} = V_i \sin \theta - g \Delta t$

You can find the  $V_y$  at any height  $\Delta y$

$V_{yf} = (v_i \sin \theta) - 2g \Delta y$

$V_x = 10$

You can find time at max height

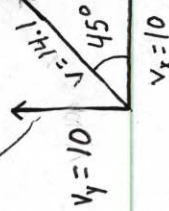
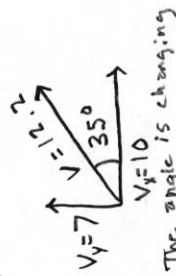
With  $t = \frac{\Delta y}{-g}$  because  $V_y = 0$

You can find max height in middle of path

Max height  $\Delta y = \frac{(V_i \sin \theta)^2}{2g}$

With time you can find  $\Delta y$  for that time in the path

$$\Delta y = V_i (\sin \theta) \Delta t - \frac{1}{2} g t^2$$



Find  $\Delta x$  with time

$\Delta x = V_i \cos \theta \Delta t$

Because  $V_i \cos \theta = V_x$  and  $V_x$  is constant

Range  $\Delta x = \frac{V_i^2 \sin(2\theta)}{g}$

if you don't have time

