Name_____ Date _____ Per. _____

PROJECTILE MOTION HELPER — PHYSICS

Objective: Keep your thoughts organized. Be able to identify the given.

GIVEN & UNKNOWN

x-direction (horizontal)	y-direction (vertical)
$\Delta d_x =$	$d_{y_o} =$ $d_{y_{final}} =$
$v_{x_o} = v_x =$	$v_{y_o} =$ $v_y =$
$a_x = 0$	$a_y = -9.8 \frac{m}{s^2}$
t =	

EQUATIONS

x-direction (horizontal)	y-direction (vertical)
$v_x = \frac{\Delta d_x}{t}$	$v_y = v_{y_o} + a_y t$ $v_y{}^2 = v_{y_o}{}^2 + 2a_y \Delta d_y$ $d_{y_{final}} = d_{y_o} + v_{y_o} t + \frac{1}{2} a_y t^2$

Don't forget

- sohcahtoa when finding components
  when angle measured from the horizontal the following is true:
  $v_x = v\cos\theta, \quad v_y = v\sin\theta$
- $\theta = \tan^{-1}\left(\frac{v_y}{v_x}\right)$ when angle measured from the horizontal

When the launch height is the same as the landing height

i) $v_y = -v_{y_o}$

ii) $d_{y_{\max}}$ & $v_{y_{peak}}$ occur at ½ total time

$v_{y_{peak}} = 0$

iii) Range = $d_x = \frac{v_o{}^2 \sin 2\theta}{g}$,

where g= 9.8 m/s^2

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