

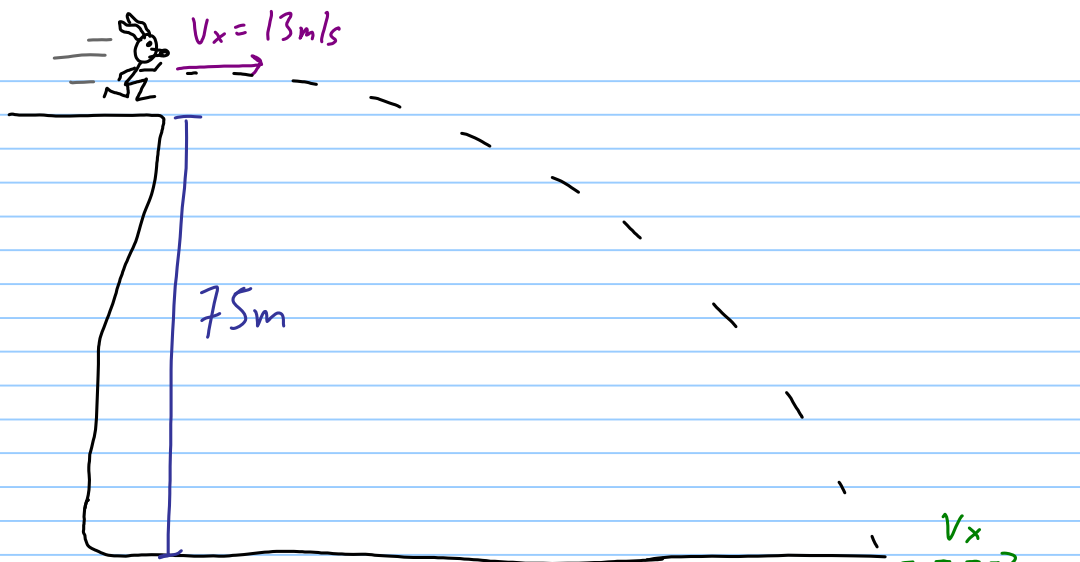
## Quiz 4b

Note Title

27/09/2012

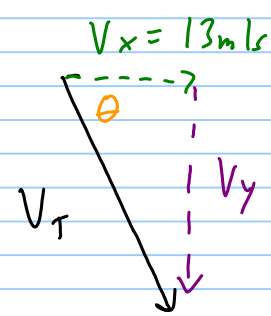
Wile E. Coyote is chasing the Road Runner when he takes a wrong turn and accidentally runs off of a 75 m high cliff. When he leaves the cliff he is running horizontally at 13 m/s.

- a. How long does it take him to hit the ground below?
- b. What is his **total** velocity upon impact?



X	Y
$V_x = 13 \text{ m/s}$	$V_y =$
$dx$	$V_{y0} = 0$
$t$	$a_y = -9.8 \text{ m/s}^2$
	$dy = -75 \text{ m}$
	$t =$

a.)  $d = v_0 t + \frac{1}{2} a t^2$   
 $d = \frac{1}{2} a t^2$  ✓  
 $t = \sqrt{\frac{2d}{a}} = \sqrt{\frac{2(-75)}{-9.8}} = 3.9123 \text{ s}$   
 $= \boxed{3.9 \text{ s}}$  ✓



$V_y = V_{y0} + a t$   
 $= 0 + (-9.8)(3.9123)$   
 $= -38.34$  ✓

$V_T^2 = V_x^2 + V_y^2$

$V_T = \sqrt{V_x^2 + V_y^2}$   
 $= \sqrt{13^2 + (-38.34)^2}$   
 $= 40.48 \text{ m/s}$

$\tan \theta = \frac{38.34}{13}$   
 $\theta = \tan^{-1}\left(\frac{38.34}{13}\right)$   
 $= 71^\circ$

$\vec{V}_T = 40. \text{ m/s } 71^\circ \text{ below the horizontal}$