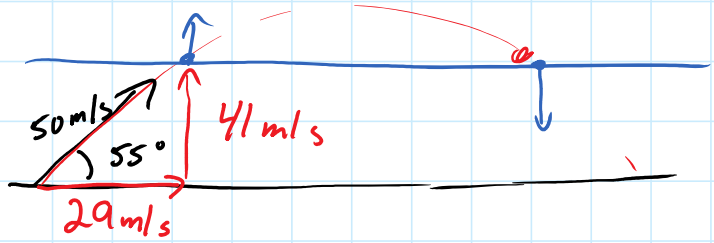
Projectiles II

Friday, February 9, 2018 8:59 AM

Ex



x	y
	$V_0 = 41\ m/s$
	$a = -9.8\ m/s^2$
	$t = 7.0\ s$
	$V_f = ?$

a) Find vertical velocity at 7.0 s.

$V_f = V_0 + at$

$= 41 + (-9.8)(7) = -27.6\ m/s$

b) Find vertical velocity when 20 m high.

$V_f = ?$

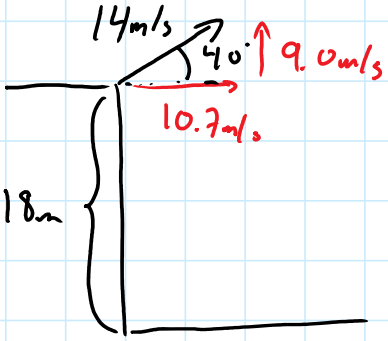
$d = 20\ m$

$V_f^2 = V_0^2 + 2ad$

$= (41)^2 + 2(-9.8)(20)$

$V_f^2 = 1289$ $\quad V_f = \pm 35.9\ m/s$

ex



find the range of the projectile

x	y
$V = 10.7\ m/s$	$V_0 = 9.0\ m/s$
$d_x = ?$	$a = -9.8\ m/s^2$
$t = ?$	$d = -18\ m$
	$t = ?$

$d = V_0 t + \frac{1}{2} a t^2$

$-18 = 9t - 4.9t^2$

$4.9t^2 - 9t - 18 = 0$

$t = \frac{9 \pm \sqrt{(-9)^2 - 4(4.9)(-18)}}{2(4.9)}$

$= 3.0\ s, \cancel{-1.2\ s}$

$$d_x = v_x \cdot t = (10.7)(3.0_s) = 32.1\,m$$