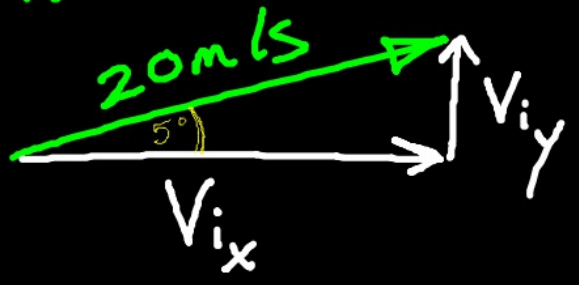
1. Antelope are the fastest animals in North America. They can leap from the ground at 20.0 m/s. If they are to leap at an angle of 5.0° above horizontal…

a. How far do they travel? (What is their range (Δx)?)

b. How high do they go?

Type II

1.



X	Y
$V_i = 19.92 m/s$	$V_i = 1.74 m/s$
$a = 0$	$a = -9.8 m/s^2$
$\Delta X = ?$	$\Delta y = 0$

$t = ?$ $\quad \Delta y = V_o t + \frac{1}{2} a t^2$

$0 = 1.74t - 4.9t^2$

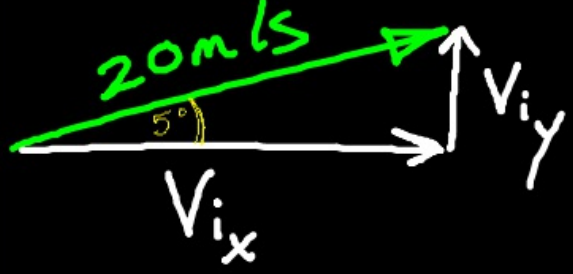
$4.9t = 1.74$

$t = 0.355 s$

$\Delta x = V_o t + \frac{1}{2} a t^2$

$= 19.92(0.355) + 0$ $\quad = 7.07 m$

1 b)



X	Y
$V_i = 19.92 m/s$	$V_i = 1.74 m/s$
$a = 0$	$a = -9.8 m/s^2$
	$\Delta y = ?$
	$V_z = 0$

$$V_f^2 = V_0^2 + 2a(\Delta y)$$

$$0 = (1.74)^2 + 2(-9.8)(\Delta y)$$

$$\Delta y_{up} = 0.15 m$$

c) $V_f = ?$ $\quad V_f = 20 m/s, -5^\circ$

You prove it!