

Name _____

After reading from the *PhysicsClassroom.com, physics tutorial, vectors-motion and forces in 2dimensions, Lesson 2: Projectile Motion*, then answer the following questions.

1. A baseball is dropped off of cliff and it accelerates to the ground at a rate of -9.8 m/s^2 downward. At the same time, a cannonball is launched horizontally from a cannon with an initial horizontal speed of 20 m/s . Remembering our kinematic equations:

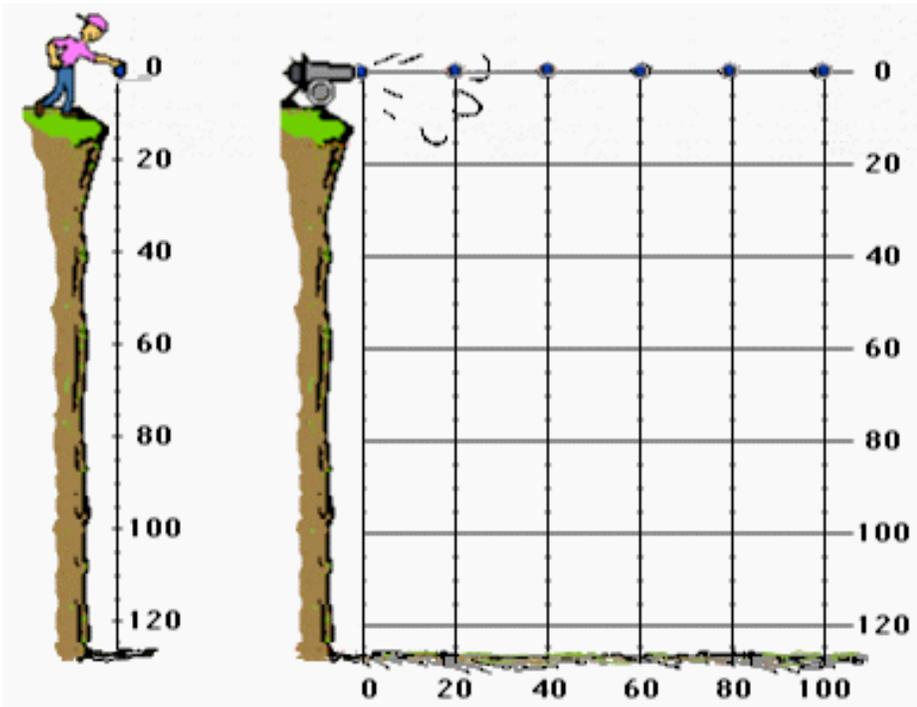
X- Direction	Y- Direction	Y- Direction
$x = vt$	$y = 4.9t^2$	$v_f = v_i + at$

Fill in the following tables using the above values.

Baseball	
Time (s)	Y(m)
0	
1	
2	
3	
4	
5	

Cannonball		
Time (s)	X (m)	Y (m)
0		
1		
2		
3		
4		
5		

2. A scale picture is shown below for both the baseball and the cannonball. Use the scale to locate the position of the baseball and cannonball for $t= 0$ to 5 seconds.



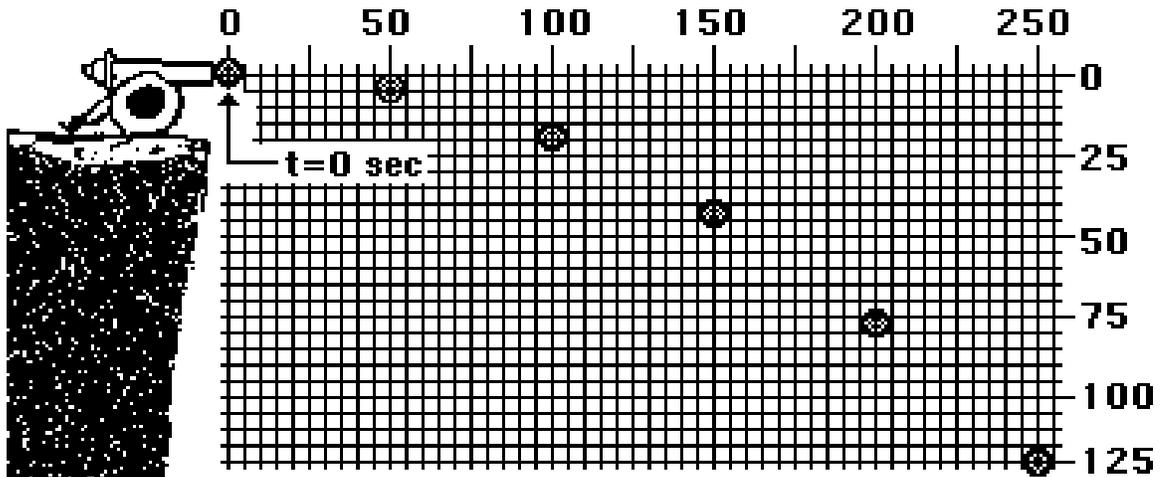
3. How long does it take the baseball to hit the ground? _____

4. How long does it take for the cannonball to hit the ground? _____
5. Compare the two diagrams from problem 2, the vertical free fall motion on the left and the 2-dimensional free fall motion on the right.
 - a. How do the vertical speeds for each compare?

b. How does the vertical speed affect the horizontal speed?

6. The diagram below show the trajectory of a horizontally launched projectile. Positions of the projectile at 1 second intervals are shown. Demonstrate your understanding of the components of displacement x and y by filling in the following table.

Time (s)	X Position	Y Position
1		
2		
3		
4		
5		



7. A ball is projected at an angle with an initial horizontal velocity of 8.0 m/s and an initial vertical velocity of 29.4 m/s as shown below. The trajectory diagram shows the position of the ball after each consecutive second. Express your understanding of projectiles by filling in the blanks:

