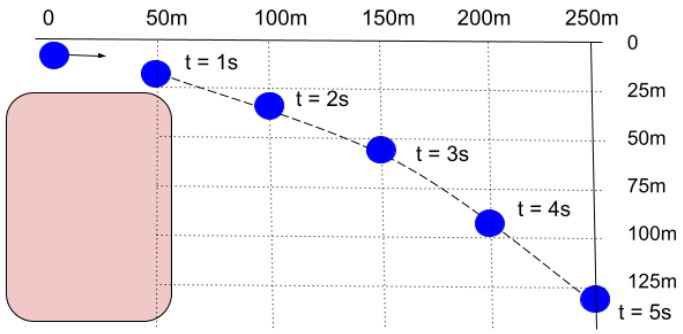
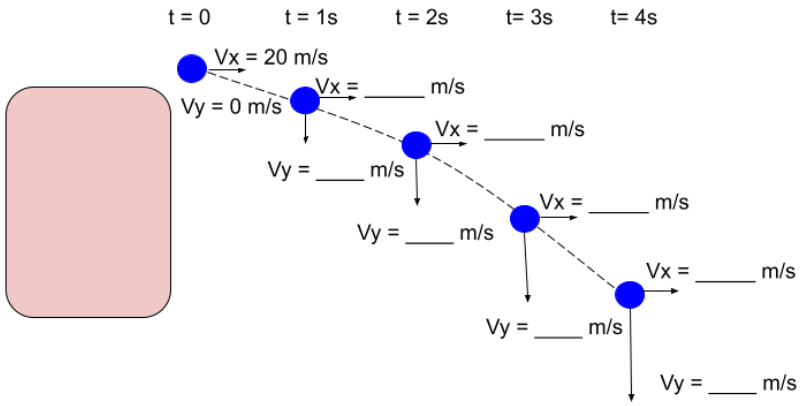
Name:_____

Homework(1): Projectile Motion

1) The diagram below shows the trajectory of a horizontally launched projectile. Positions of the projectile at 1-second intervals are shown. Demonstrate your understanding of the components of the displacement vector by determining the horizontal displacement (x) and the vertical displacement (y) after the fifth second.



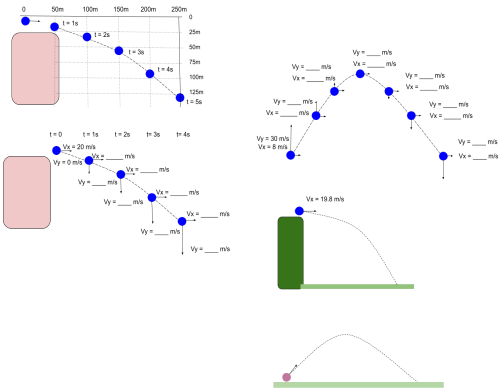
2) A ball is launched horizontally from the top of a cliff with an initial velocity of 20 m/s. The trajectory of the ball is shown below. Express your understanding by filling in the blanks.



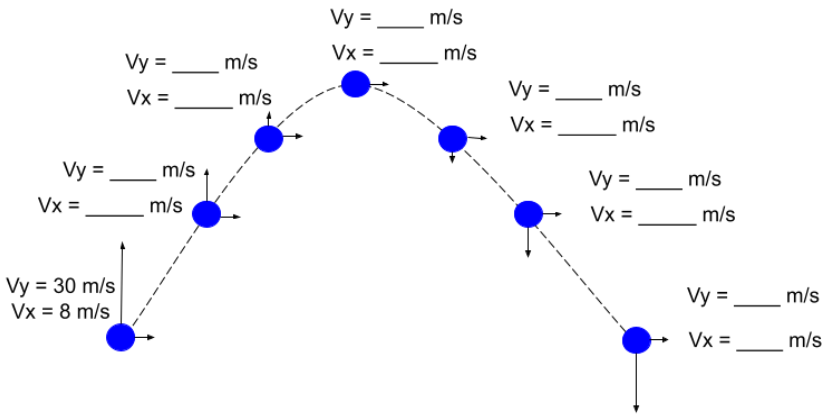
3) If the ball in the diagram above strikes the ground after four seconds, then (a) how high was the cliff and (b) how far from the base of the cliff will the ball land?

4) If the ball's initial speed in question #2 was 16 m/s, then how far from the cliff will the ball land?

5) A ball is projected horizontally from the top of a 92.0-meter high cliff with an initial speed of 19.8 m/s. Determine: (a) the horizontal displacement, and (b) the final speed the instant prior to hitting the ground.



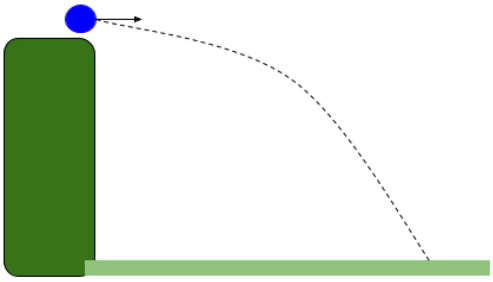
6) A ball is projected at an angle with an initial horizontal velocity of 8.0 m/s and an initial vertical velocity of 30 m/s. The trajectory diagram shows the position of the ball after each consecutive second. Express your understanding of projectiles by filling in the blanks.



7) A ball is thrown horizontally from the roof of a building 75 m tall with a speed of 4.6 m/s.

a. How much later does the ball hit the ground?

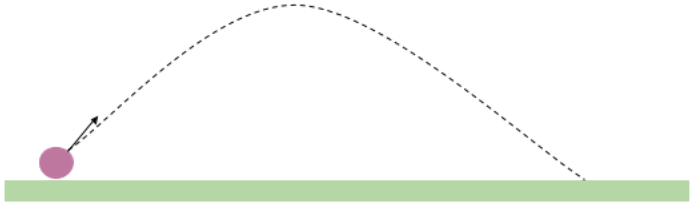
b. How far from the building will it land?



c. What is the speed of the ball just before it hits the ground?

8) A projectile is fired from the ground with an initial speed of 150 m/s at an angle of 47˚ above the horizontal.

a. Determine the total time in the air.



b. Determine the maximum height reached by the projectile.

c. Determine the maximum horizontal distance covered by the projectile.

d. Determine the speed of the projectile 2 s after firing.