

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Should be programmed in your calculator. If not, you need to do it by hand.

Name _____

Date _____

Unit 9- Assignment #17
Projectile Motion and Review

Put all problems on a separate piece of paper. You need to draw pictures and write and solve your equations

- 1) A ball rolls off the end of a table with a horizontal velocity of 3.5 feet/second. The table is 8.75 feet high. (The desk is for a Giant)
 - a) Draw a picture of the situation
 - b) Write the parametric equation for the x direction
 - c) Write the parametric equation for the y direction
 - d) Solve your y equation to find total time.
 - e) Use your time to substitute into your x equation to find how far away it landed.

- 2) A ball rolls off the edge of a 18 meter cliff at a velocity of 3.5 meters per second.
 - a) Draw a picture of the situation.
 - b) Write the parametric equation for the x direction
 - c) Write the parametric equation for the y direction
 - d) Solve your y equation to find the total time it was in the air.
 - e) How far is the ball from the cliff at this time?

- 3) Bethany hits a baseball so that it travels at an initial speed of 98 feet/second and at an angle of 25 degrees above the ground. If her bat contacts the ball at a height of 2 feet above the ground, how far does the ball travel horizontally before it hits the ground?
 - a) Draw the right triangle representation of this situation.
 - b) Write the parametric equation for the x direction
 - c) Write the parametric equation for the y direction
 - d) Solve your y equation (should use the quadratic formula) to find the total time it was in the air.
 - e) How long does it take to get to its maximum height?
 - f) What is the maximum height?
 - g) What is the horizontal distance that it traveled given this time.

- 4) Jo Jo the amazing circus boy is a human cannonball. He is fired out of a canon 15 feet above the ground at a speed of 80 feet per second. The cannon is at an angle of 65 degrees. His net hangs 25 feet above the ground. Where (horizontal position) does his net need to be positioned so that he will land safely?
- Draw the right triangle representation of this situation.
 - Write the parametric equation for the x direction.
 - Write the parametric equation for the y direction.
 - Solve your y equation (should be using the quadratic formula) to find the total time Jo-Jo was in the air. .
 - What was the maximum height that Jo-Jo reached (vertex).
 - How many seconds does it take Jo-Jo to get to the maximum height
 - Where does he need to put the net (horizontal distance) so he lands on it.

- 5) Chuck the golfer swings a 7-iron club with a loft of 32 degrees and an initial velocity of 82 feet/second on level ground.
- Draw the right triangle representation of this situation.
 - Write the parametric equation for the x direction
 - Write the parametric equation for the y direction.
 - Solve your y equation to find the total time
 - What is the maximum height
 - What is the horizontal distance the ball travels.

6) A ship is on a bearing of 125 traveling at 30 knots. (1 knot =1.15078m/h).

- Draw your picture
- Write your parametric equations
- How long before the ship is 500 miles East of where it started
- How far South is it
- Hence, what is the total distance traveled by the ship.