

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

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

Name \_\_\_\_\_

Date \_\_\_\_\_

Unit 9- Assignment #10  
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 1.5 feet/second. The table is 2.75 feet high.
  - 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 12 meter cliff at a velocity of 2 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) Carolina hits a baseball so that it travels at an initial speed of 120 feet/second and at an angle of 30 degrees above the ground. If her bat contacts the ball at a height of 3 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 20 feet above the ground at a speed of 60 feet per second. The cannon is at an angle of 50 degrees. His net hangs 5 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 28 degrees and an initial velocity of 95 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 315 traveling at 30 knots. ( 1 knot =1.15078m/h).

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