

**Algebra I**  
**Quadratic Word Problems**

Name \_\_\_\_\_

**Answer each of the following problems on a separate sheet of paper. Make sure to show your work!**

1. A watermelon is launched out of the window of an office building, and its path can be modeled by the function  $h = -4t^2 + 32t + 15$ , where  $h$  is the watermelon's height (in feet) and  $t$  is the time it has been in the air (in seconds).
  - a) How high will the watermelon be after 2 seconds?
  - b) How long will it take for the watermelon to reach its highest point?
  - c) What is the maximum height?
  - d) When will the watermelon hit the ground?
2. The path of a batted baseball as it sails toward the outfield can be modeled by the function  $h = -2t^2 + 20t + 6$ , where  $h$  is the height of the baseball (in feet) and  $t$  is the time the baseball has been in the air (in seconds).
  - a) How high will the baseball be after 1 second?
  - b) How high will the baseball be after 7 seconds?
  - c) How long will it take for the baseball to reach its maximum height?
  - d) What is the maximum height?
  - e) When will the baseball hit the ground?
3. The path of a roller coaster as it shoots over the second hill of its track can be modeled by the function  $h = -t^2 + 8t + 24$ , where  $h$  is the roller coaster's height (in feet) and  $t$  is the time (in seconds) it has been on the hill.
  - a) How long will it take the roller coaster to get to the top of the second hill?
  - b) How high is the second hill of the roller coaster?
4. A golfer is standing directly behind a tree, and decides to try to hit the golf ball over the tree. The path of his golf ball can be modeled by the function  $h = -t^2 + 8t + 24$ , where  $h$  is the golf ball's height (in feet) and  $t$  is the time it has been in the air (in seconds).
  - a) How long will it take the golf ball to reach its highest point?
  - b) If the tree in front of the golfer is 23 feet tall, will the shot be able to clear it?
  - c) When will the ball hit the ground?
5. The St. Louis Arch is a parabola whose curve is modeled after the function  $h = -0.00635x^2 + 4x$ , where  $h$  is the height of the arch (in feet) and  $x$  is the distance from one of its legs (in feet).
  - a) How high is the St. Louis Arch at its maximum height?
  - b) How far apart are the two legs of the Arch?