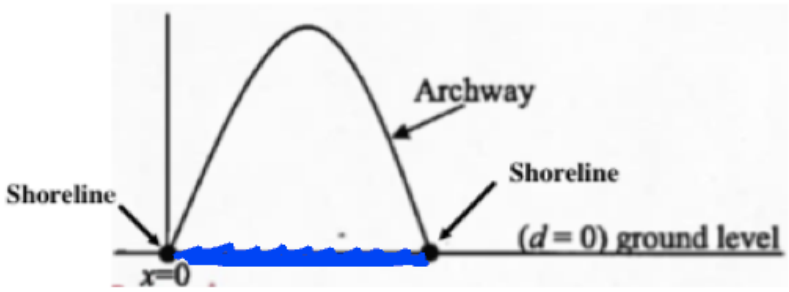
Worksheet #2 - Applying Quadratics to Real Life Situations

1. An object is moving in a straight line. It initially travels at a speed of 6 meters per second, and it speeds up at a constant acceleration. The distance d, in meters, that this object travels is given by the equation $d(t) = 2t^2 + 6t$, where t is in seconds. According to this equation, how long will it take the object to travel 108 meters?

2. The entrance into a harbor is in the shape of a parabolic archway. The archway is modeled by the equation $d = 12x - x^2$, where d represents the distance, in feet, that the arch is above the ground for any x value from the shore.



a) For what values of x will the arch be 20 feet above the ground?

b) How wide in feet is the base of the arch?

c) What is the maximum height of the arch above the water?

3. A ball is thrown into the air with an initial upward velocity of 48 ft/s. It height h in feet after t seconds is given by the function $h(t) = -16t^2 + 48t + 4$.

a) What height will the ball be when 2 seconds has passed?

b) In how many seconds will the ball reach its maximum height?

c) What is the ball's maximum height?

4. The equation $y = -16x^2 - 12x + 45$ models the number of books y sold in a bookstore x days after an award-winning author appeared at an autograph-signing reception. What was the first day that at least 100 copies of the book were sold?

5. The Demon Drop at Cedar Point in Ohio takes riders to the top of a tower and drops them. A function that approximates this ride is $h(t) = -16t^2 + 64t + 60$, where h is the height in feet and t is the time in seconds. About how many seconds does it take for riders to drop 60 feet.

6. The senior class at Bay High School buys jerseys to wear to the football games. The cost of the jerseys can be modeled by the equation $C(x) = 0.1x^2 + 2.4x + 25$, where C is the amount it costs to buy x jerseys. How many jerseys can they purchase for $430?

7. The percent of Canadian households with high speed Internet h can be estimated by $h(n) = -0.2n^2 + 7.2n + 1$, where n is the number of years since 1990. Use the Quadratic Formula to determine when 20% of the population will have high speed Internet.