

Solving Real Life Problems Involving Quadratic Equations



1) In his first time at bat in a game at Fenway Park, Derek Jeter hits a baseball toward left center field. The distance in feet, d , and height, h , can be modeled by the equation $h = -0.002d^2 + 0.18d + 4$.

a) What is the highest point the ball reaches? How far from home plate is the ball when it reaches this height?

b) Which player is more likely to catch the ball, the shortstop or the center fielder?

2) In his second at bat, the equation $h = -0.0015d^2 + 0.5d + 4$ can be used to model the path of the baseball hit by Derek Jeter.

a) What is the highest point the ball reaches? How far from home plate is the ball when it reaches this height?

b) The ball is hit toward the portion of the left field wall that is 347 feet from home plate. Was the hit a home run, off the wall, or caught?

3) A cliff diver in Acapulco, Mexico, jumps from about 17m above the water. His height in meters from the water t seconds after he jumps is given by the function $h = -4.9t^2 + 1.5t + 17$.

a) How long will it take for the diver to reach the water?

b) Find the vertex of the parabola given by the function. What does the vertex represent in this situation?

4) Based on the Census Bureau projections for the 2007-2050, the population of the United States may be modeled by $P = 0.0022675t^2 + 2.6804t + 300.76$ where P is the population in millions and t is the number of years since 2007.

a) When will the population be equal to 350 million?

b) What will be the population of the United States in 2010?

c) The graph appears to be linear. Why is that?

d) Give three examples of groups who benefit from population models such as the one above and explain why the model would be of value to them.