

Math 2

Solving Real Life Problems Involving Quadratic Equations

Day 1: Using a graphing calculator

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? Explain your decision.

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? Explain your decision.

3) 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 be in 2012?

c) The graph appears to be linear. Explain why that might be?

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.

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Day 2: No graphing calculator (algebraically)

Show me your work!

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 $h = -0.008x^2 + 1.5x + 4$.

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? Explain your decision.

2) In his second at bat, the equation $h = -0.0025x^2 + x + 4$ 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 down the right field line. Was the hit a home run, off the wall, or caught? Explain your decision.

3) 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) What will be the population of the United States be in 2020?

b) What will the population of the United States be in 2050?

c) In what year will the populations of the United States be 400 million?