

Unit 2 Day 3 Min/MAX Quadratic Applications - HOMEWORK

Solve these application problems. To find **min/max**...use the vertex.

- An arrow is shot upward with an initial velocity of 64 feet per second. The height of the arrow $h(t)$ in terms of the time t since the arrow was released is $h(t) = -16t^2 + 64t$.
 - What is the maximum height the arrow achieves? _____
 - How many seconds did it take to reach its maximum height? _____
- In 1940, Emanuel Zacchini of Italy was fired a record distance of 175 feet from a cannon while performing in the US. Suppose his initial velocity was 80 feet per second. The y can be represented by the function $y = -16x^2 + 80x$, where x represents the number of seconds that have passed.
 - How long after he was shot out of the cannon did he reach his maximum height? _____
 - What was his maximum height? _____
 - How high was he after 3 seconds? _____
- You throw a ball in the air, and the path of the ball is described by the following formula:
 $h = -16t^2 + 32t + 2$, where h is the height in feet, and t is time in seconds.
- What is the maximum height the ball will reach? _____
 - What is the height of the ball after 2 seconds? _____
 - How long does it take to reach the maximum height? _____
- During a chemistry experiment students are testing the path of a cork as it popped off a bottle. They determine the formula for the cork flying through the air to be: $h(t) = -16t^2 + 20t + 0.5$, where h is the height in feet, and t is time in seconds.
 - When will the cork reach its maximum height? _____
 - What is the maximum height? _____
 - What is the height of the cork after 0.5 seconds
- The owner of a company that produces handcrafted music stands hires a consultant to help set the selling price for the product. The consultant analyzed the production costs and consumer demand for the stands and arrives at a function for the profit. $P(x) = -0.3x^2 + 75x - 2000$, where x represents the selling price of the stands.
 - At what price should the stands be sold to earn maximum profit? _____
 - According to the function, what is the maximum profit that the company can make? _____

Answer Bank

4 96 18 125 64 2687.50 2 6.5 2 100 1.27 2.5 6.75