Name: _____ Date: _____

A2: Quadratics in Context Review

1. Suppose you are tossing an apple up to a friend on a third-story balcony. After t seconds, the height of the apple in feet is given by $h = -16t^2 + 38.4t + 0.96$. Your friend catches the apple just as it reaches its highest point. How long does the apple take to reach your friend, and at what height above the ground does your friend catch it?

2. A diver is standing on a platform and jumps from the platform. The equation $h = -16t^2 + 24t + 8$, where h is his height above the water, t is the time. How long will it take for him to hit the water?

3. The barber's profit p each week depends on his charge c per haircut. It is modeled by the equation $p = -200c^2 + 2400c - 4700$. Sketch the graph of the equation. What price should he charge for the largest profit? What is the largest profit?

4. A skating rink manager finds that revenue R based on an hourly fee F for skating is represented by the function $R = -480F^2 + 3120F$. What hourly fee will produce maximum revenues?

5. The path of a baseball after it has been hit is modeled by the function $h = -0.0032d^2 + d + 3$, where h is the height in feet of the baseball and d is the distance in feet the baseball is from home plate. What is the maximum height reached by the baseball? How far is the baseball from home plate when it reaches it's maximum height?

6. A lighting fixture manufacturer has daily production costs of $C = 0.25n^2 - 10n + 800$, where C is the total daily cost in dollars and n is the number of light fixtures produced. How many fixtures should be produced to yield a minimum cost?

8. You and a friend are hiking in the mountains. You want to climb to a ledge that is 20ft above you. The height of the grappling hook you throw is given by the function $h = -16t^2 - 32t + 5$.What is the maximum height of the grappling hook?

9. The total profit made by an engineering firm is given by the function $p = x^2 - 25x + 5000$. Find the minimum profit made by the company.

10. You are trying to dunk a basketball. You need to jump 2.5 ft in the air to dunk the ball. The height that your feet are above the ground is given by the function $h = -16t^2 + 12t$. What is the maximum height your feet will be above the ground? Will you be able to dunk the basketball?

11. A ball is thrown upward from a height of 15 ft with an initial upward velocity of 5 ft/s. Use the formula $h = -16t^2 + 5t + 15$ to find how long it will take for the ball to reach the ground.