**Day 10 – Quadratic Applications Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Practice Assignment**

1. The height of a ball in feet *x* seconds after it is thrown is given by f(x) = -16x2 + 32x + 5.

a. When will the ball reach the ground?

b. When will the ball reach a height of 7 feet?

2. The fuel economy in miles per gallon of a certain vehicle is given by f(x) = -0.01x2 + 1.2x – 5.8, where x is the car’s speed in miles per hour. For what speed(s) does the car have a fuel economy of 22 miles per gallon?

3. A foul ball leaves the end of a baseball bat and travels according to the formula h(t)= -16t2 + 64t is the height of the ball in feet and t is the time in seconds.

a. Find the maximum height reached by the ball.

b. Determine when the foul ball will hit the ground.

4. A café’s daily income depends on x, the number of customers. The function I(x) = 4x2 – 20x describes the café’s total daily income. The function C(x) = 2x2 + 5 describes the total amount the café spends in a day. The café’s daily profit P(x) is the difference between the daily income and the amount spent in a day.

a. Write a function to describe P(x). (Hint: Profit = Income – Costs).

b. Determine the number of customers needed for the café to break even on a daily basis.

(Hint: Profit = $0 at the break even point)