Name:_____ **Quadratic Optimization Re-Take**

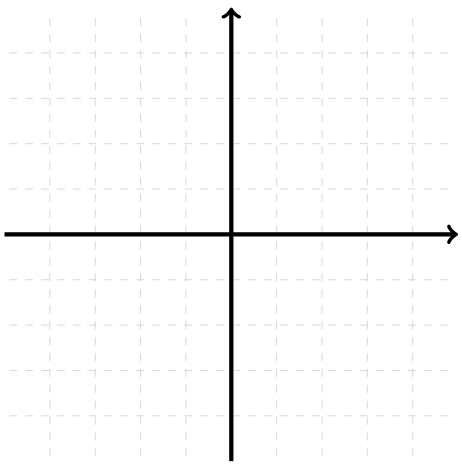
Class time (circle one): 9:30 am 11:00am

The cost of producing q items is $C(q) = 0.37q + 10$. When q items are produced, they will be sold for a price of $P(q) = 16 - 1.5q$. Profit is revenus minus costs, i.e.,

$$\text{Profit}(q) = q \cdot P(q) - C(q).$$

1. (3 points) Write an equation for Profit(q), only in terms of q. Simplify your answer completely.

2. (5 points) Sketch a graph of Profit(q), and identify which kind of function it is. Remember to label your axes!



Profit(q) is a _____ function:

(a) Linear

(b) Quadratic

(c) Greatest integer

(d) Always Increasing

(e) Always Decreasing

3. (4 points) Does Profit(q) have a minimum value, maximum value, or neither? Find the extreme value, or explain why no such value exists.

4. (3 points) Interpret your answer to Question 3. Does your answer make sense? Explain why or why not.