First Name _____ Last Name _____ Date ___ – ___ – ___ Period _____ Score _____

Learning Objectives.

- Use the profit-price graph to make informed business decisions.

Discussion.
    Suppose you own or manage a business. Setting the price for your product is one of the most nuanced decisions you will make. Discuss the prompts below with your classmates for 5 minutes and write a brief summary for each prompt.

- How might raising the price of a product affect the number of units sold?

- Can raising the price always increase profit?

- What trade-offs do businesses face when setting prices?

- As a business decision-maker, what principles will you follow when setting prices to benefit the business?

Problems.
    The grunt work has been completed. Your colleagues in market research and sales operations have collected the data, performed the calculations, and developed the following profit-price model (function): the profit, $p(x)$, in hundreds of dollars, as a function of the unit price, x, in tens of dollars, is given below

$$p(x) = -3x^2 + 13.2x - 6.8$$

Now, as the decision maker, examine the model and choose the option that best serves your business. Answer the following questions according to this model.

1. Determine if $(2, 7.5)$ and $(2, 7.6)$ are on the graph of the function rigorously. Show your justification work below.

2. Given $(1, 3.4)$ and $(4, -2)$ are two points on the graph, interpret the meaning of them in business language. (Hint: Be mindful of the units!)

3. What does "break even" mean? What should a break even point look like on the graph of the function?
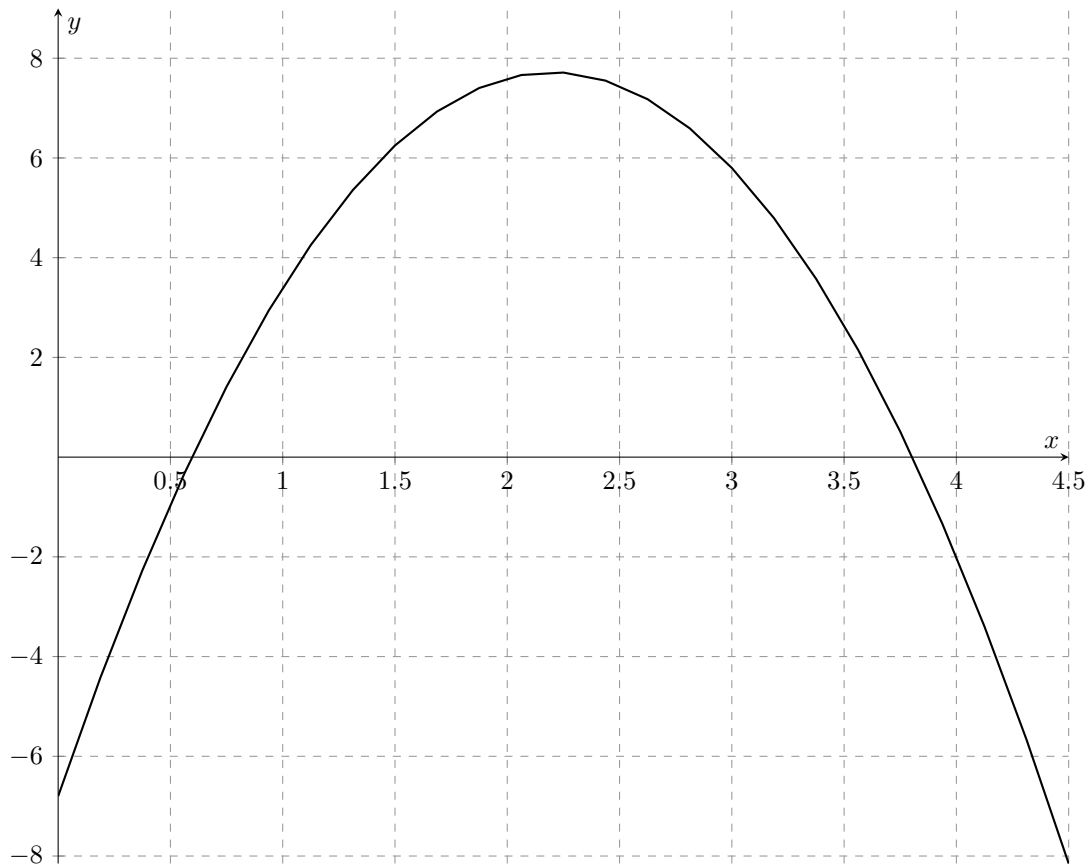
4. According to the graph of the function, what is the break even price of the business?

5. What is the price that produces the maximum profit for the business?