

MA 110 WORKSHEET (2.3)

Name _____

The research department in a company that manufactures TVs established the following price-demand and cost functions.

- A. The price-demand function where p is the wholesale price of a TV for a demand of x hundred TVs is given by $p(x) = -3x + 475$, $0 \leq x \leq 150$.
- B. The cost function where C is the cost (in hundreds of dollars) of producing and selling x hundred TVs is given by $C(x) = 75x + 8500$, $0 \leq x \leq 150$.

1. Write the function for the company's revenue for x hundred TVs sold.

- A. Think first, is this function linear or quadratic?
- B. Which function will you use from above, price-demand or cost?
- C. Write out the function $R(x)$.

2. Graph the revenue and cost functions on your graphing calculator, simultaneously. Note your window dimensions. *Your window must show the vertex of the revenue function and the intersection points of $R(x)$ & $C(x)$.*

$$X_{\min} = \underline{\hspace{2cm}} \quad Y_{\min} = \underline{\hspace{2cm}}$$

$$X_{\max} = \underline{\hspace{2cm}} \quad Y_{\max} = \underline{\hspace{2cm}}$$

3. Use your graph from part 2 to determine graphically how many TVs must be sold (to the nearest whole number) for this company to break even. (That is when the revenue is equal to the cost – or as close as possible.) *Note: Is there more than one break-even point?*

4. Write an equation for this company's profit for selling x hundred TVs.

Profit(x) = _____

5. How many (hundreds of) TVs should the company sell to maximize their profit?
Explain how you determined this answer.

6. What price will the company have to charge to sell that number of TVs?

7. Is the company's profit maximized when the company's revenue is at a maximum? This is not opinion or logic time. Your graphs hold the answers. Justify your answer mathematically.