

3. [12 points] Oren plans to grow kale on his community garden plot, and he has determined that he can grow up to 160 bunches of kale on his plot. Oren can sell the first 100 bunches at the market and any remaining bunches to wholesalers. The revenue in dollars that Oren will take in from selling b bunches of kale is given by

$$R(b) = \begin{cases} 6b & \text{for } 0 \leq b \leq 100 \\ 4b + 200 & \text{for } 100 < b \leq 160. \end{cases}$$

- a. [2 points] Use the formula above to answer each of the following questions.
- i. What is the price (in dollars) that Oren will charge for each bunch of kale he sells at the market?

Answer: _____

- ii. What is the price (in dollars) that Oren will charge for each bunch of kale he sells to wholesalers?

Answer: _____

For $0 \leq b \leq 160$, it will cost Oren $C(b) = 20 + 3b + 24\sqrt{b}$ dollars to grow b bunches of kale.

- b. [1 point] What is the fixed cost (in dollars) of Oren's kale growing operation?

Answer: _____

- c. [4 points] At what production level(s) does Oren's marginal revenue equal his marginal cost?

Answer: _____

- d. [5 points] Assuming Oren can grow up to 160 bunches of kale, how many bunches of kale should he grow in order to maximize his profit, and what is the maximum possible profit? *You must use calculus to find and justify your answer. Be sure to provide enough evidence to justify your answer fully.*

Answer: bunches of kale: _____ and max profit: _____