

Name: _____

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1. [**3 parts, 1 point each**] Let $C(q)$ represent the cost, $R(q)$ the revenue, and $\pi(q)$ the total profit (in dollars) of producing q units.
 - (a) We know that $C'(40) = 83$ and $R'(40) = 50$. Approximate the change in profit if production is increased from 40 units to 41 units.

 - (b) We know that $C'(102) = 70$ and $R'(102) = 89$. Approximate the change in profit if production is increased from 102 units to 103 units.

 - (c) The profit function $\pi(q)$ is maximized when $q = 175$. What is the relationship between $C'(175)$ and $R'(175)$?

2. [**3 parts, 1 point each**] The cost function is given by $C(q) = 500 + 10q$.
 - (a) Find the marginal cost when the production level is 50 units.

 - (b) Find the average cost when the production level is 50 units.

 - (c) When the production level is 50 units, what effect will increasing the production have on the average cost? Explain.

3. [**2 parts, 1 point each**] At a price of \$5 per ticket, a musical theater group can fill every seat in the theater, which has a capacity of 1200. For every additional dollar charged, the number of people buying tickets decreases by 75.

(a) Find the demand q for tickets in terms of the ticket price p . [*Hint: The demand q is a linear function of p . Once you know the slope and a point on the line, you can use the point-slope formula to write down the equation.*]

(b) What ticket price maximizes revenue?