

Sections 4.5, 4.6

Average Cost, Elasticity of Demand

1. The average cost per item to produce q items is given by

$$a(q) = .01q^2 - .6q + 15 \quad \text{for } q > 0.$$

- (a) What is the total cost $C(q)$ of producing q goods?
- (b) At what production level is average cost minimized?
- (c) What is the minimum marginal cost?
2. The Custom Office Company makes a line of executive desks. It is estimated that the total cost for making x units of their Senior Executive Model is $C(x) = 100x + 200000$ dollars per year.
- a. Find the average cost function.
- b. Find the marginal average cost function.
- c. What happens to the average cost when x is very large? Interpret your results.
3. There is only one company offering local telephone service in town. Would you expect elasticity of demand for telephone service to be high or low? Explain.

4. A company estimates that the weekly sales q of its product is related to the product's price p by the function $q = 15,000 - 0.65p$ where p is in dollars. Currently, each unit of the product is selling for \$8000. Determine the effect on revenue if the price were increased.

5. The consumer demand curve for Professor Stefan Schwarzenegger dumbbells is given by $q = (100 - 2p)^2$, where p is the price per dumbbell and q is the demand in weekly sales.

a. Determine the elasticity of demand E when the retail price is set at \$5, and interpret your answer.

b. At what price will revenue be a maximum? (can you do this two different ways?)

c. How many dumbbells are sold in order to maximize your revenue?