Chapter 8 #6

4. You are the manager of a monopoly, and your demand and cost functions are given by $P = 200 - 2Q$ and $C(Q) = 2{,}000 + 3Q^2$, respectively.
   a. What price–quantity combination maximizes your firm's profits?
   b. Calculate the maximum profits.
   c. Is demand elastic, inelastic, or unit elastic at the profit-maximizing price–quantity combination?
   d. What price–quantity combination maximizes revenue?
   e. Calculate the maximum revenues.
   f. Is demand elastic, inelastic, or unit elastic at the revenue-maximizing price–quantity combination?

5. You are the manager of a firm that produces a product according to the cost function $C(q_i) = 100 + 50q_i - 4q_i^2 + q_i^3$. Determine the short-run supply function if:
   a. You operate a perfectly competitive business.
   b. You operate a monopoly.
   c. You operate a monopolistically competitive business.

6. The accompanying diagram shows the demand, marginal revenue, and marginal cost of a monopolist.
   a. Determine the profit-maximizing output and price.
   b. What price and output would prevail if this firm's product was sold by price-taking firms in a perfectly competitive market?
   c. Calculate the deadweight loss of this monopoly.
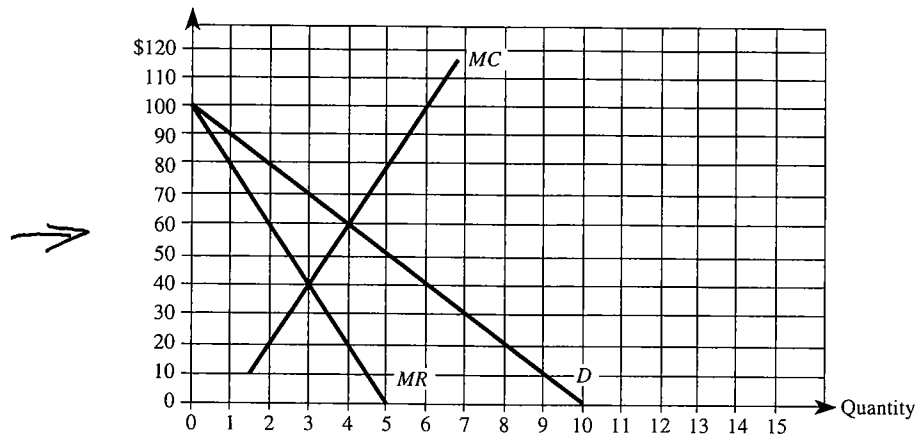
7. You are the manager of a monopolistically competitive firm, and your demand and cost functions are given by $Q = 20 - 2P$ and $C(Q) = 104 - 14Q + Q^2$.
   a. Find the inverse demand function for your firm's product.
   b. Determine the profit-maximizing price and level of production.
   c. Calculate your firm's maximum profits.
   d. What long-run adjustments should you expect? Explain.

8. The elasticity of demand for a firm's product is -2 and its advertising elasticity of demand is 0.1.
   a. Determine the firm's optimal advertising-to-sales ratio.
   b. If the firm's revenues are $50,000, what is its profit-maximizing level of advertising?

PROBLEMS AND APPLICATIONS

9. The CEO of a major automaker overheard one of its division managers make the following statement regarding the firm's production plans: "In order to maximize profits, it is essential that we operate at the minimum point of our average total cost curve." If you were the CEO of the automaker, would you praise or chastise the manager? Explain.

10. You are the manager of a small U.S. firm that sells nails in a competitive U.S. market (the nails you sell are a standardized commodity; stores view your nails as identical to those available from hundreds of other firms). You are concerned about two events you recently learned about through trade publications: (1) the overall market supply of nails will decrease by 2 percent, due to exit by foreign competitors; (2) due to a growing U.S. economy, the overall market demand for nails will increase by 2 percent. Based on this information, should you plan to increase or decrease your production of nails? Explain.