

ECON2103 Microeconomics

Chapter 10 Exercises

1. A firm faces the following average revenue (demand) curve:

$$P = 120 - 0.02Q$$

where Q is weekly production and P is price, measured in cents per unit. The firm's cost function is given by $C = 60Q + 25,000$. Assume that the firm maximizes profits.

- What is the level of production, price, and total profit per week?
 - If the government decides to levy a tax of 14 cents per unit on this product, what will be the new level of production, price, and profit?
2. The following table shows the demand curve facing a monopolist who produces at a constant marginal cost of \$10:

Price	Quantity
18	0
16	4
14	8
12	12
10	16
8	20
6	24
4	28
2	32
0	36

- Calculate the firm's marginal revenue curve.
 - What are the firm's profit-maximizing output and price? What is its profit?
 - What would the equilibrium price and quantity be in a competitive industry?
 - What would the social gain be if this monopolist were forced to produce and price at the competitive equilibrium? Who would gain and lose as a result?
3. A firm has two factories for which costs are given by:

Factory #1: $C_1(Q_1) = 10Q_1^2$

Factory #2: $C_2(Q_2) = 20Q_2^2$

The firm faces the following demand curve:

$$P = 700 - 5Q$$

where Q is total output – that is, $Q = Q_1 + Q_2$.

- a. On a diagram, draw the marginal cost curves for the two factories, the average and marginal revenue curves, and the total marginal cost curve (that is, the marginal cost of producing $Q = Q_1 + Q_2$). Indicate the profit-maximizing output for each factory, total output, and price.
 - b. Calculate the values of Q_1 , Q_2 , Q , and P that maximize profit.
 - c. Suppose that labor costs increase in Factory 1 but not in Factory 2. How should the firm adjust (that is, raise, lower, or leave unchanged) the following: Output in Factory 1? Output in Factory 2? Total output? Price?
 - d. If the United States eliminates the tariff and the voluntary restraint agreement is approved, what will be the U.S. domestic price of the metal?
4. Michelle's Monopoly Mutant Turtles (*MMMT*) has the exclusive right to sell Mutant Turtle t-shirts in the United States. The demand for these t-shirts is $Q = 10,000/P^2$. The firm's short-run cost is $SRTC = 2000 + 5Q$, and its long-run cost is $LRTC = 6Q$.
- a. What price should *MMMT* charge to maximize profit in the short run? What quantity does it sell, and how much profit does it make? Would it be better off shutting down in the short run?
 - b. What price should *MMMT* charge in the long run? What quantity does it sell and how much profit does it make? Would it be better off shutting down in the long run?
 - c. Can we expect *MMMT* to have lower marginal cost in the short run than in the long run? Explain why.
5. The employment of teaching assistants (TAs) by major universities can be characterized as a monopsony. Suppose the demand for TAs is $W = 30,000 - 125n$, where W is the wage (as an annual salary), and n is the number of TAs hired. The supply of TAs is given by $W = 1000 + 75n$.
- a. If the university takes advantage of its monopsonist position, how many TAs will it hire? What wage will it pay?
 - b. If, instead, the university faced an infinite supply of TAs at the annual wage level of \$10,000, how many TAs would it hire?