

Assignment 5

Intermediate Micro, Spring 2008

Due: Thursday, April 10th

Directions: Answer all questions completely. Note the due date of the assignment. Late assignments will be accepted at the cost of 15 points per day, up until 12:30pm (beginning of class) on Tuesday, April 15th. At that time I will return the graded assignments and post the answers on the web. You may turn in assignments to me after that time so that I can check your work for you, but please realize that you will not receive a grade for the assignment. You may work in a group consisting of up to 3 members – for each group please turn in only 1 set of answers and make sure all group member names are on that set of answers. All group members will receive the same grade.

1 Monopoly (70 points)

Suppose that a monopolist faces the following inverse demand curve, $P(Q) = 65 - 5Q$. The firm's total cost function is: $TC = 2.4Q^3 - 19Q^2 + 66.5Q + 40$.

Qty.	Price	TR	MR	TC	MC	Profit
0			xxx		xxx	
1						
2						
3						
4						
5						
6						

- (6 points) Write down this monopolist's total revenue and marginal revenue functions solely as a function of quantity.
- (10 points) Fill in the table above, using the cost function and the inverse demand function above.
- (6 points) What is this monopolist's profit-maximizing price and quantity? (Use the table and assume the monopolist can only produce integer amounts.)
- (6 points) Calculate the price elasticity of demand at the profit-maximizing quantity.
- (6 points) Calculate the Lerner Index at the profit-maximizing quantity.
- (6 points) Suppose that the demand for the monopolist's product becomes more elastic, so that the inverse demand function is now $P(Q) = 65 - 2Q$. Recalculate the price and the marginal revenue (for 0 through 6 units of the good) using this inverse demand function.
- (6 points) Find the profit-maximizing price and quantity when the inverse demand function is $P(Q) = 65 - 2Q$. (Again, assume the monopolist can only produce in integer amounts.)
- (6 points) Calculate the price elasticity of demand at the profit-maximizing price and quantity when the inverse demand function is $P(Q) = 65 - 2Q$.
- (6 points) Calculate the Lerner Index at the profit-maximizing quantity when the inverse demand function is $P(Q) = 65 - 2Q$.

10. (6 points) Does the monopolist have more market power when the inverse demand function is $P(Q) = 65 - 5Q$ (relatively inelastic) or $P(Q) = 65 - 2Q$ (relatively elastic)? How do you know?
11. (6 points) If you were a monopolist which of these demand curves would you rather face? Explain.

2 Price-taker market (30 points)

Currently, the price in the perfectly competitive market is \$65. The following is a price-taking firm's cost table:

Quantity	TC	TFC	TVC	ATC	AVC	MC
1	100	50	50	100	50	50
2	140	50	90	70	45	40
3	177	50	127	59	42.3	37
4	216	50	166	54	41.5	39
5	265	50	215	53	43	49
6	324	50	274	54	45.7	59
7	399	50	349	57	49.9	75
8	496	50	446	62	55.8	97

1. (5 points) Given that the price is \$65, how much should the firm produce if it wishes to maximize profit? (Assume the firm must produce integer amounts.) Explain how you found your answer.
2. (5 points) What is the profit at the profit-maximizing quantity that you found in part 1?
3. (10 points) Given the firm's costs above, what is the lowest possible price this firm could see in the market and still choose to continue to produce rather than to shutdown? Explain how you know.
4. (10 points) Assume that this is a constant-cost industry. What would the price of the good have to be in order for the firm and market to be in long-run equilibrium? Explain.

3 Bonus (5 points)

In problem number 2, the monopolist's total cost function is: $TC = 2.4Q^3 - 19Q^2 + 66.5Q + 40$. Find the monopolist's average total cost function and marginal cost function.