

Assignment #7

Due Friday 11/10/06 by 6 p.m. in the Econ 301-1 slot in the Economics Alcove

Please show the calculations used to arrive at your answers. Draw graphs neatly and label axes and points clearly. In general, leave numbers in fractional form while solving problems. Round final answers to the first decimal place if necessary.

A. Radcliff Inc., a monopolist with costs  $C(Q) = \frac{1}{2} Q^2 - 100Q + 140,000$  faces the market demand curve  $Q = 5000 - 10P$ .

- (1) a. What is the inverse demand curve? What is the marginal revenue curve?
  - b. Graph the inverse demand, marginal revenue, marginal cost, and average total cost curves on the same graph.
- (2) a. What is Radcliff's profit maximization problem? Solve for quantity and price and show this point on your graph.
  - b. How much are Radcliff's profits? Show the area representing profits on your graph from (1).
- (3) a. What would the quantity and price be under perfect competition? Show this point on your graph.
  - b. Show on a graph (the same graph, or a new one) the loss in consumer and producer surplus caused by this monopoly and calculate the deadweight loss.
- (4) The government imposes a quantity tax of  $t = \$30$  on this market.
  - a. Calculate the new market quantity and price. How much profit does the monopolist make now?
  - b. How much tax revenue is collected? Draw a new graph and compare the tax situation to the no-tax situation for the monopolist, including showing the tax revenue area on your graph.

B. For each of the following questions, come up with an original (i.e., not from the book or from class notes, and not the same as anyone else's) example from real life to illustrate the concept.

- (1) a. Give an example of second-degree price discrimination
  - b. Give an example of third-degree price discrimination
- (2) Give an example of near-perfect first-degree price discrimination.
- (3) Give an example of a bundling scheme.
- (4) Give an example of a natural monopoly and discuss how it might be best dealt with (e.g., left alone, regulated to price at average cost, regulated to price at marginal cost with a subsidy, or dealt with in another way).

C. Destination Theater is a movie theater in a medium-sized city. If the theater is open, the owners have to pay a fixed nightly amount of \$500 for films, ushers, and so on, regardless of how many people attend. If the theater is closed, its costs are zero. The nightly demand for movies by college students is  $Q_s = 220 - 40P_s$ , where  $Q_s$  is the number of movie tickets demanded by students at price  $P_s$ . The nightly demand for movies by nonstudents is  $Q_n = 140 - 20P_n$ .

(1) Assume Destination charges a single price  $P$  to everyone

- a. What is the aggregate demand function  $Q(P)$  for movies? What is the inverse demand function  $P(Q)$ ?
- b. What is the profit-maximizing  $Q$ ? What is the profit-maximizing  $P$ ? What is  $\pi$  (profits)?  
How many tickets are sold to students? How many to nonstudents?

(2) Now assume that the ticket seller can accurately separate students from nonstudents (e.g., by having students show a nonforgeable college photo i.d.). Students cannot resell their tickets.

- a. What price  $P_s$  is charged to students? What is  $Q_s$ ? What price  $P_n$  is charged to nonstudents?  
What is  $Q_n$ ?
- b. What is  $\pi$  now?

(3) Why do movie theaters charge so much for refreshments? Can you give an explanation of this based on any of the theories in Chapter 25?

D. (1) There are 20 firms in the market for wodgets. Each firm faces a demand curve:  $q = 150 - 5P$ . Each firm has the cost function  $C(q) = 6q + 120$ .

- a. What quantity does each firm supply? What price does each firm charge?
- b. What are profits for each firm? Are costs minimized?
- c. Is this a long-run market equilibrium? If not, describe (qualitatively) what will happen in the market.
- d. Is monopolistic competition less efficient than perfect competition? Explain carefully.

(2) There are 12 MacDonalds located at equal distances around an island of 1 mile in circumference. People are located with uniform density around the island. No one can live in or travel through the interior (it has active volcanos). Every night all 200,000 people on the island go out to eat a Big Mac. It costs \$5 per person per mile to travel on the island. It costs \$5,000 in fixed costs to operate a MacDonalds each night and costs \$2 per person to serve a Big Mac.

- a. What is the optimal number of MacDonalds for the island? How many people would have to live on the island for the optimal number of MacDonalds to be 20?
- b. Why might the actual number of MacDonalds be greater than the optimal number?  
Should this type of market be regulated with respect to entry? Why or why not?

(3) Is it possible to have a market with too much variety? If you said yes, give an original example from real life of such a market and explain why you think the amount of variety is excessive. If you said no, explain why.

(4) Is it possible to have a market with too little variety? If you said yes, give an original example from real life of such a market and explain why additional variety does not arise in that market. If you said no, explain why.