

UNIVERSITY OF WISCONSIN

Economics 101 – Spring 2007

Professor Brown

Problem Set 10

Due by April 18-20, 2007

Monopoly: Single Price vs. Perfect Price Discrimination

- 1) Suppose daily demand for airplane tickets from Madison to Chicago is given by the equation $Q_D = 640 - 2P$.
 - a. If every plane has over 640 seats, and flying a plane between these points costs \$35,000 plus \$20 per passenger, how many tickets would a monopoly airline sell, assuming it must charge all passengers the same price. Show this on a carefully labeled diagram.
 - b. What will the airline's profit be? What will be the consumer surplus and deadweight loss?
 - c. If the airline were able to *perfectly* price discriminate, how many tickets would it sell? What range of prices would be charged? Is there consumer surplus or deadweight loss?
 - d. What is the average total cost at the optimal quantity in part c? Why is it optimal for the airline to sell some tickets below average cost?

Natural Monopoly and Regulation

- 2) Suppose the annual cost of providing telephone service to the city of Springfield is given by the equation $TC = 50 + 2Q$, while annual demand for telephone services in Springfield is given by the equation $P = 42 - 2Q_D$.
 - a. Show that there is a natural monopoly. Provide some intuition for why we might expect a natural monopoly for provision of phone services.
 - b. Give one reason the city of Springfield might want to allow only one provider of telephone service.

- c. Suppose the city government auctions off a license to be the monopoly provider of phone services for one year. What is the most you expect a firm to be willing to pay for the license? (Your answer should be a number.)

Monopoly: Short Run and Long Run

- 3) A monopolist in the salt market has demand given by the equation $Q_D = 22 - P$ and has total costs equal to $TC = 110 + 2Q$. Quantity is measured in ounces, and you may assume that units are infinitely divisible.
- Assuming the monopolist can charge only one price, what will be the consumer surplus and monopoly profit? In addition to the algebraic solution, provide a carefully labeled diagram showing the monopolist's price and quantity as well as the consumer surplus.
 - Will the monopolist stay open in the short run? How about in the long run? Explain.
 - Now suppose the monopolist can perfectly price discriminate. Calculate the consumer surplus and producer profit.
 - Which one is more efficient; outcome in part a or outcome in part c?

Monopoly: Multiple-Choice Questions

- 4) If a monopoly lowers its price, its
- total revenue must rise
 - total revenue must decrease
 - marginal revenue must increase
 - marginal revenue must decrease
- 5) Perfect price discrimination describes a situation in which the monopolist
- knows the exact willingness to pay of each of its customers
 - charges exactly two different prices to exactly two different group of customers
 - maximizes consumer surplus
 - experiences a zero economic profit