

**University of Notre Dame
Department of Finance
Economics of the Firm
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Problem Set #2: (Note that the highlighted questions can be calculated using excel)

- 1) Suppose the inverse demand for Bananas is given by

$$P = 10 - .2Q$$

The marginal cost of producing bananas is equal to \$2.

- a) Show how to set up the problem (i.e. calculate total revenues and marginal revenues, profits, etc).

Quantity	Price	Total Revenue	Marginal Revenue

- b) Calculate the price and quantity a monopoly would produce**
 c) At the profit maximizing price, calculate the elasticity of demand. Show that your markup is inversely related to this elasticity.
 d) Calculate the difference in consumer surplus between a perfectly competitive outcome and a monopolistic outcome

- 2) Suppose that you are the manager of an opera house. You have a constant marginal cost of production equal to \$50 (i.e. each additional person in the theatre raises your costs by \$50 – we will ignore any fixed costs for now.) You have estimated your demand curve for tickets as follows:

$$Q = 150 - P$$

- a) Calculate the profit maximizing ticket price.**

Quantity	Price	Total Revenue	Marginal Revenue

Now, suppose that you re-estimated your demand curve, but this time, you estimated different demand curves for men and women:

$$Q = \begin{cases} 175 - P, & \text{if consumer is male} \\ 125 - P, & \text{if consumer is female} \end{cases}$$

- b) **Now, calculate the prices you would charge if you could distinguish between male and female consumers (i.e. ticket purchasers show up to the box office to buy tickets) and charge different prices.** Why might you be concerned about secondary markets forming for your product?
- c) Calculate your profits in (a) , (b) and (c) .

- 3) Continuing with the same example, suppose again, that you are faced with the same demand curve(s)

$$Q = \begin{cases} 175 - P, & \text{(women)} \\ 125 - P, & \text{(men)} \end{cases}$$

- a) Suppose that you were to set a price equal to your marginal cost. Calculate the consumer surplus derived by both consumers.
 - b) If you could distinguish between the types of consumers, how would you set up your prices to maximize profits? (i.e. you could start up an “opera lover’s society” and charge a membership fee)
 - c) How would your answer to (b) change if you could not distinguish between customer types? (i.e. you could sell different ticket packages.)
- 4) Suppose that you are George Lucas. You are in the process of packaging the final trilogy (actually the three prequels) of Star Wars for sale to the public. Your marginal costs of production are \$2 per movie. Further, you know that there are two types of consumers that you face: children under the age of 10 and everybody else.

Children under 10: Love Jar Jar Binks

Everybody else: Would like to see Jar Jar crushed by a very large truck

Consequently, willingness to pay for each of the three movies is based on how many minutes Jar Jar is on the screen.

Movie	Under 10yrs old	Over 10 yrs Old
Episode 1	\$60	\$5
Episode 2	\$30	\$40
Episode 3	\$10	\$50

- a) If you sold these three movies separately, what would your prices be?
 - b) If you only sold these movies as a box set, what should you charge?
 - c) Calculate your profits for (a) and (b).
- 5) Suppose that you have two manufacturers: one company specializes in the production of left shoes (They have a store called “The Left Shoe Emporium”). Another company specializes in right shoes (“Right Shoes ‘R’ Us”). Consumers have a demand for shoes given by:

$$Q = 150 - P$$

Where P is the price of a pair of shoes: $P = P_L + P_R$. For simplicity, assume that marginal costs for each firm constant and equal to zero.

- a) Suppose that “Right Shoes are US” choose to set a 30 price for a right shoe. Write down the inverse demand curve faced by “The Left Shoe Emporium”
- b) Set up the maximization faced by “The Left Shoe Emporium” (i.e. show how total revenue and marginal revenue are calculated).

Quantity	Price	Total Revenue	Marginal Revenue

- c) Calculate the “Left Shoe Emporiums” profit maximizing price.
- d) Given your answer to (c), calculate “Right Shoes ‘R’ Us’ profit maximizing price.
- e) Show that if \$50 per shoe is an optimal price for both companies (i.e. if one company charges \$50, the other company’s best choice of price is \$50.)
- f) Now, suppose that these two companies merged. What would happen to the price of a pair of shoes?