

University of Notre Dame
Department of Finance
Economics of the Firm
Fall 2011
Midterm Exam

Name _____

- 1) (3 points) Microsoft office professional 2010 retails for \$499.99. The individual titles (Word, Excel, etc) sold separately sell for \$139.99 apiece. What is Microsoft's pricing strategy here?

This mixed bundling strategy (selling both individual titles as well as the bundle) allows Microsoft to take advantage of differences in preferences across consumers. Some consumers place a very high value on one particular title and a very low preference of the others – they will buy the individual product. Others have mild preferences over all the titles – they will buy the bundle.

- 2) (3 points) Peanut Butter and Jelly are two goods that would be considered complements (they are used together). Why might it be better for the consumer to have one company selling both goods rather than a peanut butter company and a jelly company?

With peanut butter and jelly being compliments, a high markup on peanut butter effects jelly sales adversely (likewise a high markup on jelly effects peanut butter sales adversely). With two separate companies selling these goods, those adverse effects are not taken into account, but will be if one company sells both.

- 3) (3 points) What are some characteristics that define a perfectly competitive industry?

- *Large number of sellers*
- *Identical products*
- *Firms earn zero profits*
- *$HHI = 0$*
- *$P = MC$*

- 4) (3 points) Suppose that you have an industry where the dominant firm controls 30% of the market and 7 additional firms control 10% each. Calculate the HHI index for this industry. What would the HHI index be for a monopolized industry?

$HHI = 30^2 + 7(10^2) = 1600$. A monopoly has an HHI index of 10,000

- 5) (3 points) Suppose that you face an elasticity of demand equal to -1.5. If you were interested in raising revenues, should you raise your price or lower it? Explain.

With an elasticity of -1.5, a 1% decrease in price will raise sales by 1.5%. Lowering price will increase revenues.

- 6) (3 points) Explain why price always equals marginal revenue in a perfectly competitive industry, but price is always greater than marginal revenues in a monopolized industry.

A perfectly competitive firm takes the market price as given. Therefore, every additional sale raises revenues by that market price. For a monopoly facing a downward sloping demand curve, every additional sale requires decreasing the price charged not just to the new customer but existing customers that would've paid a higher price. Therefore,

MR = Price charged to the new sale – lost revenue from lowering price to existing sales

- 7) (3 points) Explain the concept of efficiency. Why would a businessman be interested in finding inefficient outcomes?

Efficiency refers to allocating all resources to their highest value use. If markets are inefficient, then there are resources not being used to their highest potential. A businessman should be able to exploit these inefficiencies to make profits.

- 8) (3 points) On its most recent income statement, GM reported net income equal to \$4.6B. GM has 1.6B shares of stock outstanding selling for \$26.50 per share. Is GM earning economic profit? Explain.

- 9) (3 points) Suppose that firms in a perfectly competitive market were earning economic profits. How would the market adjust? (i.e. what happens to total supply, market price, number of firms, and production per firm)?

If firms are earning economic profits, then new firms will enter the market. Total supply increases, number of firms increases, production per firm goes down, and the price falls.

- 10) (3 points) Explain using supply and demand how increased ethanol production affects the price of a steak (hint: ethanol is produced from corn which is also used to feed cattle).

Increased demand for ethanol raises the demand for corn. This raises the market price of corn. Since corn is an input to raising cattle, the supply of cattle drops which raises the price of cattle (and, hence, the price of a steak).

11) (15 points) Suppose that you have the following industry demand curve:

$$Q = 12 - 2P \text{ (Note...we can solve this for price: } P = 6 - .5Q \text{)}$$

a) Complete the following chart:

Quantity	Price	Total Revenue	Marginal Revenue
1	5.50	5.50	5.50
2	5	10	4.50
3	4.50	13.50	3.50
4	4	16	2.50
5	3.50	17.50	1.50
6	3	18	.50
7	2.50	17.50	-.50
8	2	16	-1.50

b) If you were a monopolist interested in maximizing total revenues, what price would you charge? What is the elasticity of demand at this point?

A monopolist maximizing revenues would charge a \$3 price and sell a quantity of 6. The elasticity of demand at this point is -1 (no calculation necessary here)

c) Suppose that your marginal cost is equal to \$2 (no fixed costs). What is your profit maximizing price as a monopolist? Calculate your profit and producer surplus.

A monopoly will always increase sales as long as MR is greater than or equal to MC. Here a monopolist charges a \$4 price and makes 4 sales.

$$\text{Profit} = \text{Total Revenues} - \text{Total Costs} = \$16 - \$2*4 = \$8 = \text{Producer Surplus}$$

d) Calculate the elasticity of demand at your profit maximizing price.

We need two points to calculate this:

$$P = \$4, Q = 4$$

$$P = 3.50, Q = 5$$

$$\% \Delta Q = \left(\frac{5-4}{4} \right) * 100 = 25\%$$

$$\% \Delta P = \left(\frac{3.50-4}{3.50} \right) * 100 = -12.5\%$$

$$\varepsilon = \frac{\% \Delta Q}{\% \Delta P} = \frac{25}{-12.5} = -2$$

- e) Given a marginal cost of \$2, what price would a perfectly competitive industry charge? What would profits in a perfectly competitive industry be?

A perfectly competitive industry will have a price equal to marginal cost (in this case, price equals \$2 and sales equal 8)

Profits equal zero.

- f) Calculate elasticity of demand at the perfectly competitive market price.

As in (d)

We need two points to calculate this:

$$P = \$2, Q = 8$$

$$P = 1.50, Q = 9$$

$$\% \Delta Q = \left(\frac{9-8}{8} \right) * 100 = 12.5\%$$

$$\% \Delta P = \left(\frac{1.50-2}{2} \right) * 100 = -25\%$$

$$\varepsilon = \frac{\% \Delta Q}{\% \Delta P} = \frac{12.5}{-25} = -.5$$

12) (15 points) Suppose that you are the manufacturer of razors. The razors blades and the handle can be sold separately or as a package. Assume that the marginal cost of the blades is \$1 each and that the handles can be produced for \$5. Consumers will buy multiple blades, but only one handle. You face two potential customers given by the following demand curves:

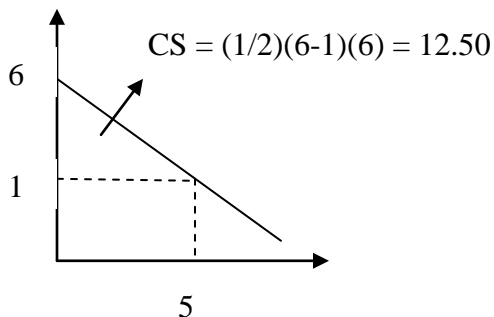
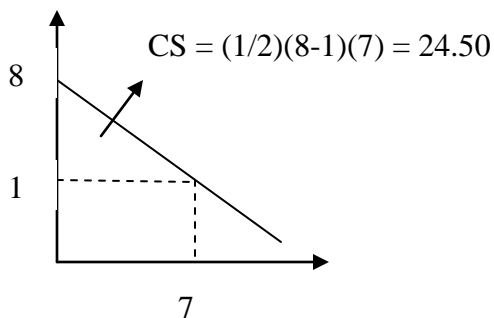
$$Q = 8 - P \quad (\text{The Grizzly Adams Type})$$

$$Q = 6 - P \quad (\text{Normal Beard})$$

For each of the above demand curves, P represents the price per blade and Q represents the number of blades purchased. Assume that for any given price of blades, consumers will select how many blades to buy and will then be willing to pay up to their consumer surplus for the handle.

- a) Suppose that competition in the market for blades forced you to sell the blades for \$1 each. If you could sell the handle for different prices to the two different types of customers, what prices would you choose for the handles?

We will set the blade price at \$1 and then charge each group their consumer surplus for the handle...



- b) How would your answer to (a) change if you could not identify the two customer types?

If we had to charge one common price...

Option A: Charge 12.50 to everyone.

You will sell two handles for 12.50 apiece: Profit = $2 * 12.50 - 2 * 5 = 15$

Option B: Charge 24.50 to everyone

You will sell 1 handle for 24.50: Profit = $24.50 - 5 = 19.50$

You should set a 24.50 price.

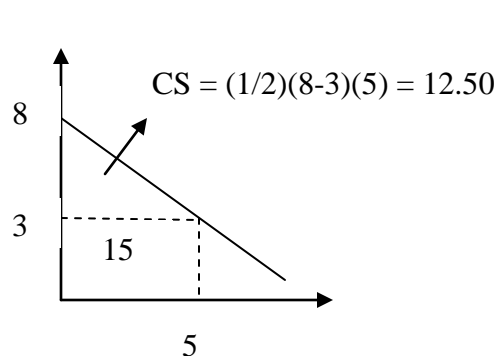
- c) Suppose that you packaged the blades and razors together (i.e. 1 handle packaged with x blades). If you could sell different packages to the different customer types for different prices, what would your packages be and what prices would you set for each package?

You should have a package with a handle and 7 blades for $24.50 + 7 = 31.50$

Also, you will have a package of a handle with 5 blades for $12.50 + 5 = 17.50$

- d) How would your answer to (c) change if you could not identify customer type?

We need to figure out how much consumer surplus grizzly adams would get from buying the 5 pack and then subtract that from the 7 pack price:



Grizzly will pay up to 27.50, but we are currently charging 17.50. Therefore, he gets \$10 of surplus

7 Pack Price = $31.50 - 10.00 = 21.50$

5 Pack Price = 17.50

- e) Now, suppose that you could control both the price of the handle and the blades. If the handle and blades were sold separately, what would your pricing strategy be if you could identify the different customer types? What if you couldn't identify the two customer types? (No calculations here just a general description).

If we are selling blades and handles separately and can control the price of each and can observe customer types, we will charge a low price for the blades and a high price for the handle as in part (a). If we can't identify type, we will charge a low price for the handle (to make sure everybody buys the handle) and then a high price on the blades.

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