

## Discussion 11

### Difficult problems from Midterm 2.

3. Monica gets utility from consuming two goods, bread and wine. When the price of bread is \$3 per loaf and the price of wine is \$4 per bottle, Monica buys 4 loaves of bread and 3 bottles of wine to maximize her utility. Now suppose the price of bread increases from \$3 to \$5, while the price of wine and Monica's income remain unchanged. Monica chooses the new bundle 4 loaves of bread and 1 bottle of wine to maximize her utility. What can we say about wine for Monica?
- Wine is an inferior good for Monica.
  - Wine is a Giffen good for Monica.
  - Wine is a normal good for Monica.
  - There is not enough information to reach any conclusion.

Firm A uses only labor to produce blackboards and pays \$100 in rent. The first worker that it hires can make 10 blackboards a day, while each additional worker produces 2 fewer blackboards than the worker before (meaning that the second worker produces 8 blackboards, third worker produces 6 blackboards, etc). The price of 1 blackboard is \$20, while the wage for a worker is set at \$120 a day. Assume that Firm A is perfectly competitive in both the blackboard market and labor market.

25. If the firm hires 1 worker, AFC is \_\_\_ and AVC is \_\_\_\_.
- 22, 4.2
  - 25, 5
  - 100, 120
  - 10, 1.2
28. Assume that all the firms in the perfectly competitive soup market are currently operating at their minimum long run average cost, and that firms do not experience constant returns to scale. This winter is especially cold, so the demand for soup goes up. Which one of the following will occur in the long run equilibrium?
- Price will increase; Each firm will produce more
  - Price will stay the same; Each firm will produce more
  - Price will stay the same; New firms enter the market
  - Price will increase; New firms enter the market
31. Which of the following gives a **correct** value of economic profit for a profit maximizing, competitive firm?
- $(AR-ATC)/Q$
  - $(P-AVC)*Q - AFC$
  - $TVC + TFC - TR$
  - $MC*Q - TFC - AVC*Q$

**Important Topics**

- Marginal Revenue
- Input Markets

**Problem 1**

Consider the market for archery lesson in Nottingham. Market demand for archery lessons is given by  $P = 250 - 2Q_D$ . Merry Men Incorporated is granted a legislated monopoly over archery lessons in Nottingham by King Richard. The company has a cost function  $TC = 100 + 10q + q^2$ , with marginal cost  $MC = 10 + 2q$ .

- Suppose the CEO of Merry Men Inc, Robin of Locksley, has not taken any economics classes and so chooses a quantity as if he was in a perfectly competitive market (i.e. he charges a price equal to his marginal cost). What price and quantity will be supplied?
- The shareholders fire Robin and replace him with Guy of Gisbourne. Instead of setting price equal to marginal cost, Guy ruthlessly attempts to maximize his revenue. Plot total revenue as a function of quantity. What quantity maximizes revenue and what is the elasticity of demand at this point?
- The shareholders are still not entirely happy so they fire Guy of Gisbourne and hire the Sheriff of Nottingham instead. The Sheriff is even more devious than Guy and he manages to maximize profits. Plot his marginal revenue curve and calculate what quantity and price he uses.
- What can you say about the elasticity of demand at the quantity the Sheriff decides to produce?
- What is the profit at the quantity the Sheriff decides to produce?
- What is the deadweight loss (DWL) caused by Merry Men Inc acting like a monopolist instead of a competitive firm?
- If the government wants to put a price ceiling in order to minimize DWL, what price ceiling should it put? What is the DWL now?

**Problem 2**

Some undergraduate students form a research group to study the market of a popular video game called "Grand Theft Auto V". Suppose Rockstar North Company is the only provider of this game and the current monopoly price for this game is \$80. Their large-scale survey result shows that 9 in every 10 students who plan to buy this game would still be willing to buy this game if the price of this game increases by \$4. Assume each student only buys one set of this game.

- In order to estimate the demand elasticity of this game, this group assumes that their survey represents the actual demand change. According to this assumption, how large is the demand elasticity of this game at current price \$80?
- Suppose this company's marginal cost is  $MC = 0.05q$ , market demand curve is linear and our estimation of demand elasticity is precise. How many sets of this PC games is produced at this monopoly price? (Hint: Assume the demand curve is  $P = b - kQ$ )

**Problem 3**

A monopoly firm operates under cost structure and faces with market demand as summarized by the information in the below table.

Quantity	Price	Total Revenue	Marginal Revenue	Total Cost	Marginal Cost
0	200			100	
1	180			130	
2	170			170	
3	160			220	
4	150			280	
5	140			350	
6	130			430	
7	120			520	
8	100			620	

- a. Complete the missing values in this table. What is the profit-maximizing level of output? What is the profit-maximizing profit?
- b. What is the social desirable output and price? How much profit does firm get under this socially desirable outcome?