

**EE211 Assignment #3 (Section 2 Semester 2/2020)**

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**Instructions:**

- Assigned date is Thursday the 13<sup>th</sup>, May 2021. **Due date is Friday the 21<sup>th</sup>, May 2021 before 11.59 PM.**
  - Submission is only received through BE Moodle platform as PDF file.
  - Name your file as StudentID\_nickname, such as 1234567489\_Bo.
  - There is no need to rewrite the question into your answer sheets. Indicating clearly question and item number is sufficient.
  - Write your nickname and student ID on top-right corner of the first page.
  - For those who do not have a digital device to write on, you can write your answers in sheets of paper, take pictures, convert them into a single PDF then submit in on Moodle.
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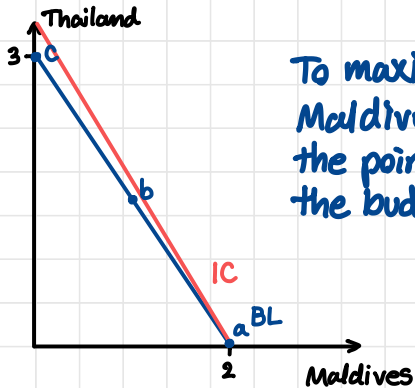
1. Neo loves traveling. Supposed he has two choices of destination, Thailand and Maldives which costs him 3,000 baht and 5,000 baht respectively. His utility received from traveling to Maldives is twice compared to traveling to Thailand. Answer the following questions.

- a) If Neo has 10,000 baht of budget, how many times of each destination he will choose to travel and why? Draw his indifferent curve and budget line to analyze his decision and indicate details on the graph.
- b) If his budget increases to 20,000 baht, draw his income-consumption curve. Also plot his income demand of traveling in Thailand, find its slope and explain.

2. Consider a long-run production in which there are only two inputs labor and capital, and the input prices for labor and capital are wage ( $w$ ) and interest rate ( $r$ ), respectively. Suppose that at the equilibrium levels of labor and capital ( $L^*$ ,  $K^*$ ), the marginal product of labor ( $MP_L$ ) and marginal product of capital ( $MP_K$ ) are 6 and 8, respectively.

- a) (5 points) Calculate the marginal rate of technical substitution (MRTS) and state the cost-minimization conditions of this firm, given that the required output is fixed at  $Q_0$ . If the market wage rate ( $w$ ) is \$3, what is the interest rate at the equilibrium?
- b) (5 points) Suppose now that the wage rate ( $w$ ) increases to \$4, ceteris paribus. Draw a diagram to illustrate the changes in the cost-minimizing combination of inputs.

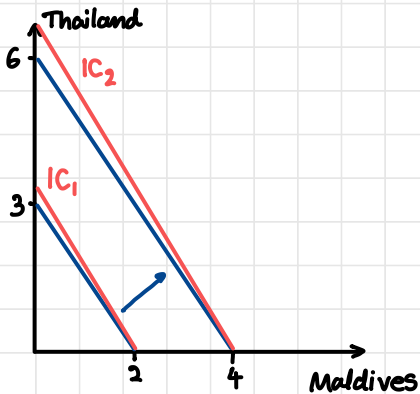
1. a.



To maximize utility, he will travel to Maldives 2 times (point a). Since it's the point that holds the most utility for the budget.

$$U(a) > U(b) > U(c)$$

b.



Slope = 0 since he has no demand traveling to Thailand because at budget of 20,000 Baht, he would maximize utility by traveling to Maldives 4 times instead.

2. a. Cost is minimized when  $MRTS = MRMS$

$$MRTS_{LK} = \frac{MPL}{MPK} = \frac{6}{8}$$

$$MRMS_{LK} = \frac{w}{r} = \frac{3}{r}$$

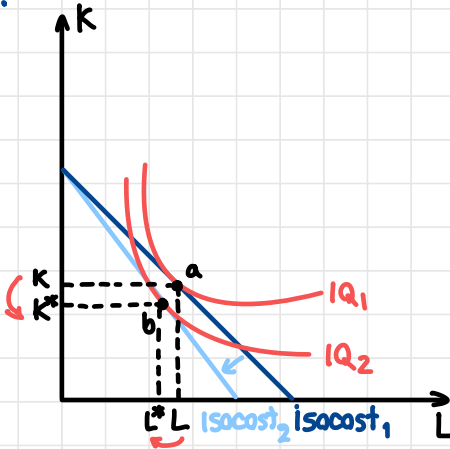
$$MRTS_{LK} = MRMS_{LK}$$

$$\frac{6}{8} = \frac{3}{r}$$

$$r = 4$$

$\therefore$  interest rate = 4 \$.

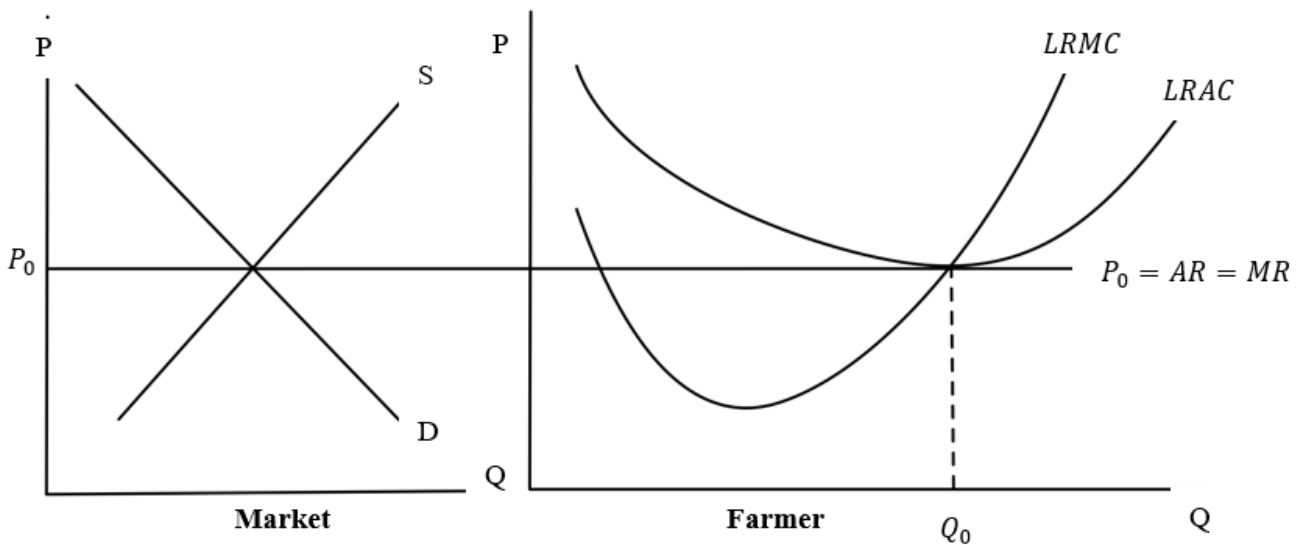
b.



As it cost more for the firm to hire labor (3\$  $\rightarrow$  4\$) makes Isocost change from Isocost<sub>1</sub> to Isocost<sub>2</sub>. At the new isocost, firm need to change input to the new combination from point a to point b, with lower capital ( $K \rightarrow K^*$ ) and lower labor ( $L \rightarrow L^*$ ).

If the firm wants output to remain the same at  $Q_0$ , They'll need to increase the budget to meet the increase of wage.

3. A Thai rice farmer is in a long run equilibrium in a perfect competition and produces at the quantity  $Q_0$  as shown in the graph below.



- The government grants a lump sum subsidy to every farmer. How will this change the LRAC? Explain why LRMC does not change.
- Will the lump sum subsidy change the quantity the farmer wants to produce to maximize his profit? Show in the graph that the farmer now earns an Excess Profit. Explain.
- Demonstrate how this Excess Profit will affect the market price in the Long Run that allows new entry to the market.

4. An inverse demand function in a monopoly market is given by

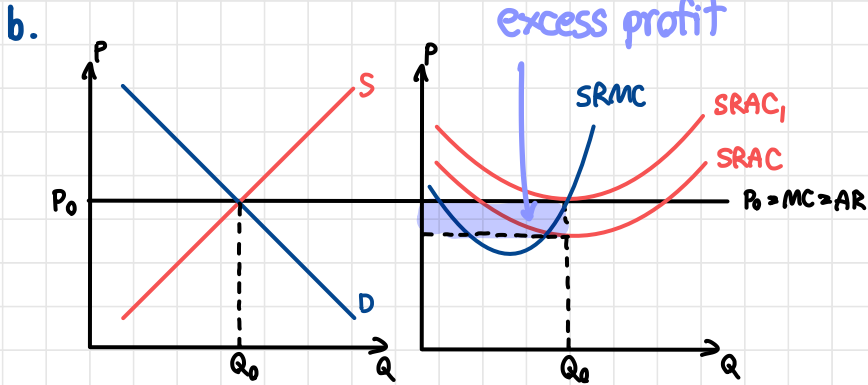
$$P = 100 - 5Q$$

Supposed that the monopolist is very efficient, which gives a constant marginal cost of \$20, answer the following questions.

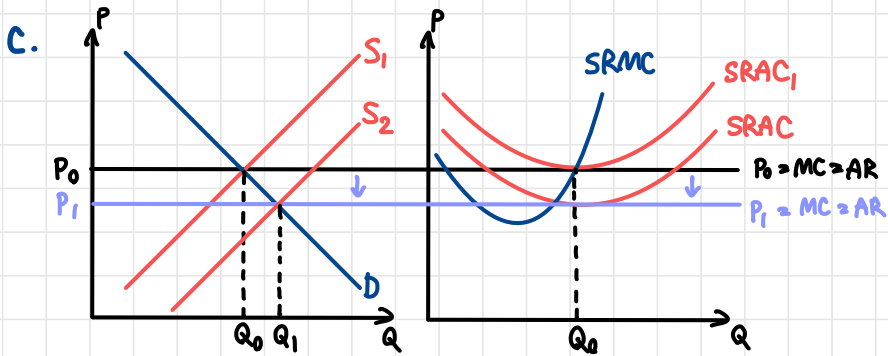
- How many units of this product will be produced that maximizes monopolist's profit in the short-run? Also, how much does this product cost? Show your argument clearly.
- How much is the total variable cost when the monopolist's profit is maximized?
- If this monopolist has a fixed cost of \$160, how much is the monopolist's profit?

3. a. As the government grants a lump sum subsidy, fixed cost will decrease, as well as total cost and average cost

Lump sum subsidy is fixed amount subsidy. So it will decrease fixed cost, not variable cost. So it won't affect marginal cost.



As farmers receive lump sum subsidy, their cost of will decrease. With the same amount of revenue, they gain excess profit. In SR, they will produce at  $Q_0$ . But in LR, as they gain more profit, they would want to produce more to maximize profit.



In LR, as they gain more profit, they would want to produce more, leads to supply curve shifts from  $S_1$  to  $S_2$  and meet the new equilibrium and new price at  $P_1$ . The market returns to normal profit.

4. a. Profit is maximized when  $MR = MC$

$$MC = 20$$

$$TR = pq = 100Q - 5Q^2 \rightarrow MR = \frac{dTR}{dQ} = 100 - 10Q$$

$$MC = MR$$

$$20 = 100 - 10Q$$

$$Q = 8$$

$$P = 100 - 5Q$$

$$= 100 - 5(8)$$

$$= 60$$

$\therefore$  8 units will be produced

$$\text{Cost} = 60 \$$$

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b. MC is constant = 20 \$,  $MC = AC$

$$TVC = (MC \cdot q)$$

$$= 20 \cdot 8$$

$$= 160 \$$$

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5. Assumed both a product market and a labor market are perfectly competitive, a table of marginal product is given below.

| Unit of labor | Marginal product of labor |
|---------------|---------------------------|
| 2             | 12                        |
| 3             | 8                         |
| 4             | 6                         |
| 5             | 4                         |
| 6             | 2                         |

This product can be sold in the market for \$12 each while labor wage is \$48, answer the following questions clearly.

- a) Figure out how many units of labor this firm will choose as input for its production to maximize profit. Illustrate a graph to support your answer and explain.
- b) Supposed that there is a sudden economic recession driving consumers' purchasing power downward, what would happen to the units of labor hired by this firm? Support your answer with illustrations that also show a connection between product market and labor market.

6. Consider these statements and indicate which one of the choices fits with each statement and roughly explain why.

**Choices:**

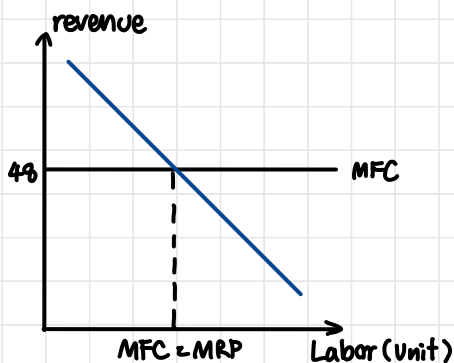
- 1. Not a market failure
- 2. Market power
- 3. Externalities
- 4. Public goods
- 5. Moral hazard
- 6. Adverse selection

- a) People feel that price level is hiking.
- b) Morpheus always hears a loud fight coming from a room next to his.
- c) Trinity does not receive her full-benefit until her first 3-month of her work position.
- d) In Chiang Mai, there is no earthquake alarming system.
- e) Starbucks coffee is more expensive than Amazon coffee.

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5.

a.



To maximized profit,  $MFC = MRP$

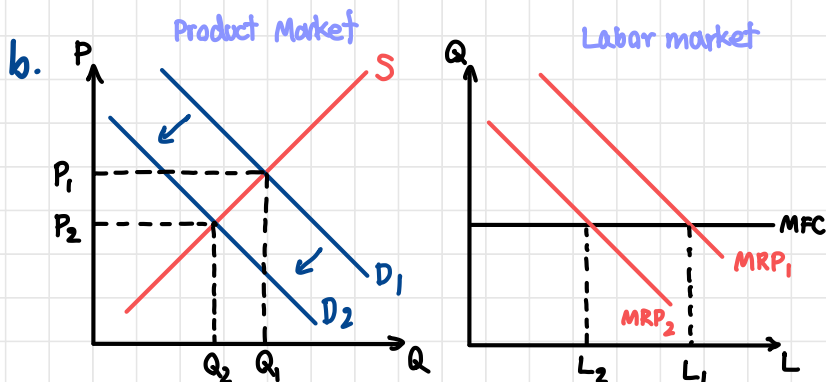
$$MRP = MP \cdot MR, \quad MFC = 48, \quad MR = P = 12$$

$$MFC = MRP$$

$$48 = 12 \cdot MPL$$

$$MPL = 4 \longrightarrow \text{hire 5 units of labor}$$

$\therefore$  To maximize profit, the firm needs to hire 5 units of labor.



The sudden decrease of purchasing power leads to the decrease of demand, which shifts demand curve from  $D_1$  to  $D_2$ , price decrease from  $P_1$  to  $P_2$ .

For the labor market,  $MRP = MR \cdot MP$ , if  $P \downarrow$ ,  $MR \downarrow$  as well, which makes  $MRP$  shift from  $MRP_1$  to  $MRP_2$  and meet the new equilibrium at the lower unit of labor (from  $L_1$  to  $L_2$ ).

6. a) **Not a market failure**, because it is just a speculation of people. Plus, inflation is normal.
- b) **Externalities**, it is a negative external factor from people living next door.
- c) **Moral hazard**, In the first 3 months, she might not bear full responsibilities of her work.
- d) **Public good**, Earthquake alarm system is a public good, as it benefits everyone.
- e) **Market power**, Starbucks has market power to set a higher price than Amazon. Although they sell same products.