Assignment 1

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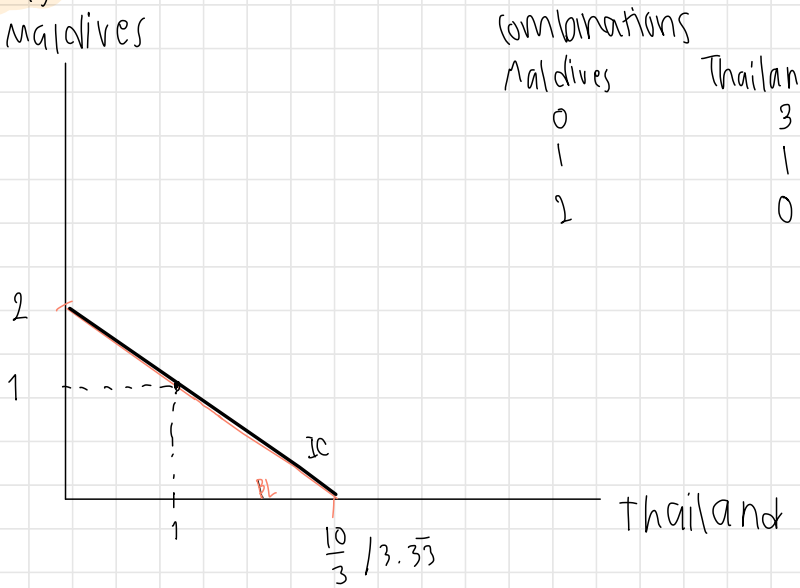
Question 1:

Question (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.

(1.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.

(1.b) If his budget increases to 20,000 baht, draw his income-consumption curve (ICC). Also plot his income demand of traveling in Thailand, find its slope and explain.

1.a)



combinations

Maldives	Thailand
0	3
1	1
2	0

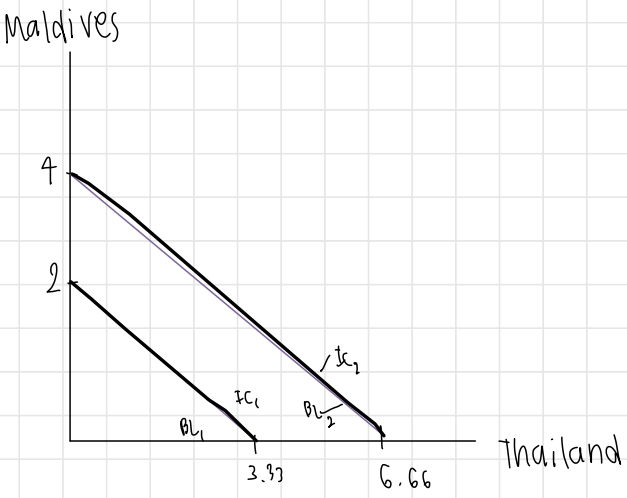
$$\frac{MU_{Thailand}}{P_{Thailand}} = \frac{MU_{Maldives}}{P_{Maldives}}$$

$$\frac{1}{3000} < \frac{2}{5000}$$

* Maldives recieve twice as much utility as Thailand

∴ Neo should travel to Maldives 2 times, Thailand 0 times.

1. b) income consumption curve



Travel to Thailand 0 times
Travel to Maldives 4 times.

combinations

Maldives	Thailand
0	6
1	5
2	>
3	1
4	0

Neo could choose to go to maldives only because it yields the maximum utility.

Question (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.

(2.a) Calculate the marginal rate of technical substitution (MRTS), 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?

(2.b) 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.

question 2:

2.a) $|MRTS_{LK}| = \frac{\Delta K}{\Delta L}$ or $\frac{MP_L}{MP_K}$

$MRTS_{LK} = \frac{6}{8} = 0.75$

output fixed at Q_0

$\frac{MP_L}{MP_K} = \frac{w}{r}$ $\quad \frac{6}{8} = \frac{3}{r}$

interest rate is \$4 at the equilibrium

$6r = 24$

$r = 4\$$

2.b) wage 3 → wage 4

cost minimizing

Because of the increase in wage, to minimize cost, firms will hire less labor. They will instead buy more capital. Since labor and capital are substitutes, capital could become cheaper. Firms will then buy more capital instead.

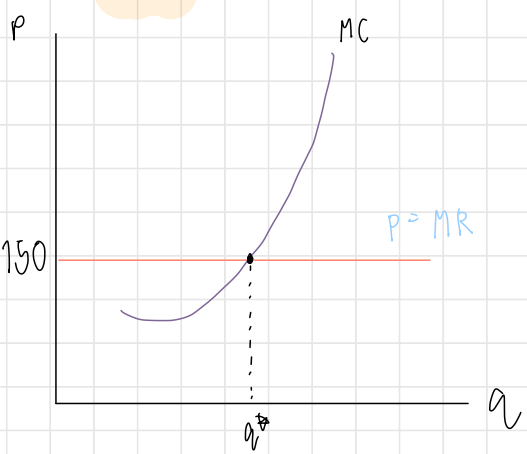
Question (3) Consider a perfectly competitive market, in which the current equilibrium price is 150 baht per unit.

(3.a) Suppose that a firm in this market sells 20 units of its output. State the profit-maximizing condition of this firm and draw a diagram to illustrate how the equilibrium quantity is determined.

(3.b) At this equilibrium quantity of 20 units, suppose that the firm's average total cost is 180 baht and its average fixed cost is 60 baht. Calculate this firm's average variable cost, total revenue, total cost, and profit.

question 3:

3.a)



Profit maximization condition is when MR = MC (marginal revenue = marginal cost) The equilibrium is at q^* and has the price of 150 baht.

(For a perfectly competitive market)

3.b)

$q = 20$ $P = 150$

$ATC = 180$ $AFC = 60$

Answer:

$ATC = AVC + AFC$

$AVC = ATC - AFC$

$AVC = 180 - 60 = 120$ ฿

$TR = P \cdot q = 150 \cdot 20 = 3000$ ฿

$TC = ATC \cdot q = 180 \cdot 20 = 3600$ ฿

$\text{Profit } (\pi) = TR - TC$

$= 3000 - 3600 = -600$ ฿

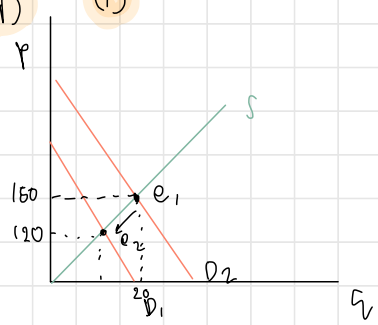
(3.c) From (3.b), should this firm stay in the market in the short run? Justify your answer.

TFC = 1200

(3.d) Suppose now that the market demand decreases and the market price decreases to 120 baht per unit. Draw two diagrams to illustrate: (i) the change in the equilibrium price and quantity in the market, (ii) how the change in the market price affects the firm equilibrium quantity and profit. Would your answer from part c. change?

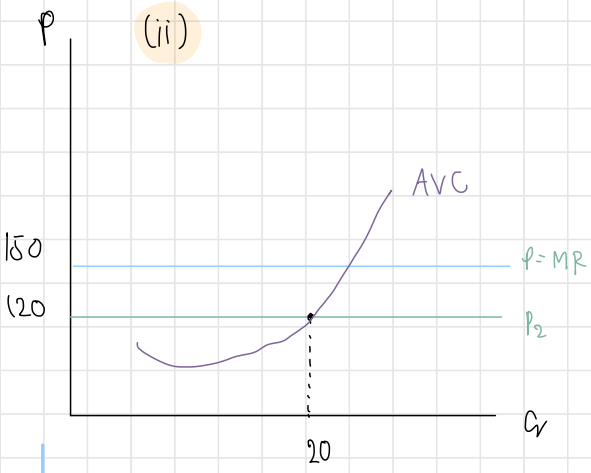
3.C) Yes, they should stay in the market because the price is more than AVC. Therefore, their total revenue can cover all the variable costs. If the firm decides to shutdown, they will lose their fix cost (1200 ฿). So they would lose only 600 ฿ if they choose to stay open.

3.d) (i)



The demand to produce in the firm will decrease, therefore, shifting the quantity down and also the supply they are willing to produce. The equilibrium shifts from $e_1 \rightarrow e_2$.

(ii)



The answer from question c would not change because the AVC is still equal to the P_2 (120฿).

Question (4) House and Land (HL) is the monopolist in a luxury housing market. It is a very efficient firm in which workers can construct houses with constant marginal cost and average cost. The demand and cost functions for HL are given as follows. (P is in million-baht unit).

$$P = 60 - 0.6Q$$

$$MC = AC = 24$$

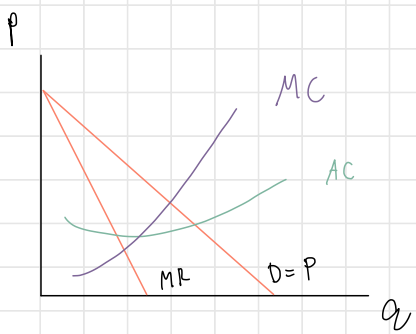
(4.a) Derive the marginal revenue function. Draw a diagram to illustrate the demand, marginal revenue, marginal cost, and average cost.

(4.b) State the profit-maximizing condition for HL and determine the optimal units of houses. Also, indicate the profit in the diagram, and explain how this profit can be derived.

(4.c) The government tries to encourage more people to have access to luxury houses, so they launch a policy forcing HL to sell their houses at the ideal price. Draw another diagram to indicate the ideal price and determine the corresponding quantity at this price. Illustrate the social welfare before and after the intervention in the diagram and discuss.

Question 4:

4.a) Marginal revenue = $\frac{\Delta TR}{\Delta Q}$ / $\frac{dTR}{dq}$

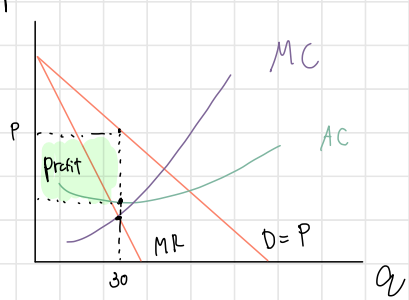


$TR = P \cdot Q$

$TR = (60 - 0.6Q)(Q) = 60Q - 0.6Q^2$

$\frac{dTR}{dQ} = 60 - 1.2Q = MR$

4.b)



Profit maximization is when MR = MC

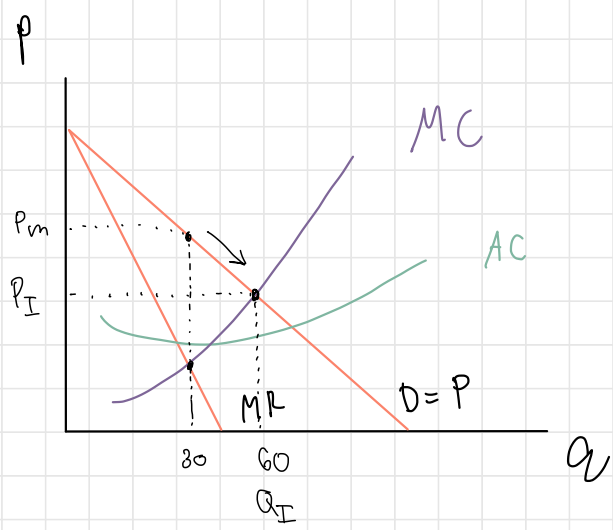
optimal units MR = MC

$60 - 1.2Q = 24$

$-1.2Q = -36$

$Q = 30$ houses

4.c)



Ideal price $P = MC$

$60 - 0.6Q = 24$

$-0.6Q = -36$

$Q = 60$

When the government forces to the ideal price, the price would be lower than before in the monopoly market.

Question (5) Consider this payoff matrix for Mook and Mix, they are competitors in an oligopoly sweetened product. Mook's payoff (bold) and Mix's payoff (regular) in this table is in thousand(s) baht unit. Discuss how you figure out a Nash equilibrium in this game.

		Mix		
		Boba tea (B)	Ice-cream (C)	Donut (D)
Mook	Boba tea (B)	**1**, 2	**3**, 5	**2**, 1
	Ice-cream (C)	**0**, 4	**2**, 1	**3**, 0
	Donut (D)	**-1**, 1	**4**, 3	**0**, 2

Question 5:

Nash equilibrium is at Mook choose D, Mix choose C (4, 3)

This point because both have the best choice.