

Instructions

- (1) Please read the instruction carefully.
- (2) Please read each question carefully and answer the questions straightforwardly. Always provide economic reasons at least a paragraph for your analysis, or a graph when necessary, even when the question does not indicate so.
- (3) Handing and submitting assignments are only available via BE Moodle.

Answering the questions and preparing answer sheets

- (1) Answers are to be handwritten, in either digital or analog form, in a blank canvas or any clean paper. Make sure that your handwriting is clearly visible and readable.
- (2) There is no need to rewrite the question. Just indicate the question number clearly for each of the answer, such as 1.a).
- (3) When done, for the digital case, collage all the pages into a single PDF file. For those who write on sheets of paper, take photo of all pages then convert all of them into a single PDF file as well.
- (4) Name your PDF file as StudentID_YourNickname, such as 640123456_Bo.

Submitting your answers

- (1) Make sure your file does not exceed 10MB. This is the maximum file size for BE Moodle upload.
- (2) Login to BE Moodle, head into the course, then the assignment topic.
- (3) Choose your file to submit. Done. There will be timestamp for your upload date and time, so please make sure to not submit later than that.

1. 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.

1.a) 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?

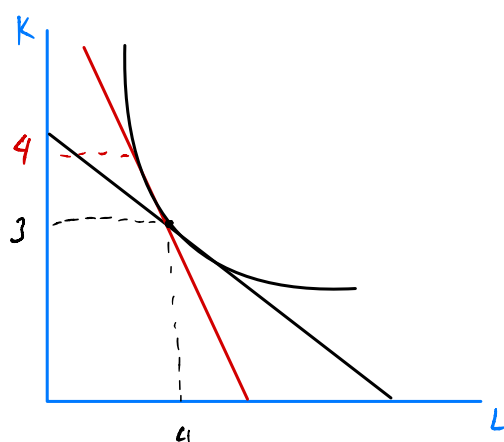
$$|MRTS| = \frac{MP_L}{MP_K} = \frac{6}{8} = \frac{3}{4}$$

$$|MRTS_{LK}| = \frac{\Delta K}{\Delta L} = \frac{w}{r}$$

$$\frac{3}{4} = \frac{3}{r}$$

$$r = 4$$

1.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.

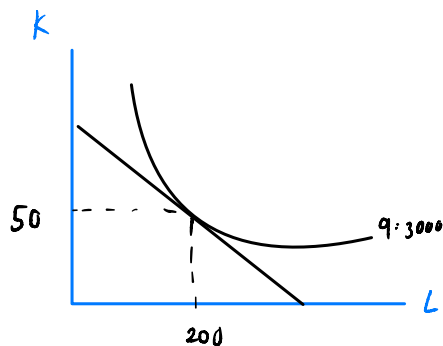


Assignment 2

Assigned on Apr 9th, 2022. To be submitted on Apr 23th, 2022 before midnight

2. Suppose that in the long-run production of wine, a firm uses two inputs: workers (L) and machines (K). At the required output of 3,000 bottles of wine, the firm's least-cost input combination is 200 units of L and 50 units of K , and the per-unit input prices for L and K are \$10 and \$20, respectively. Suppose further that at this least-cost combination of inputs, the marginal product of the 50th machine (MP_K) is 8 bottles of wine.

2.a) Draw a diagram to illustrate this firm's cost-minimization decision, where L is on the x-axis and K is on the y-axis. Also, explain the firm's cost-minimization conditions.



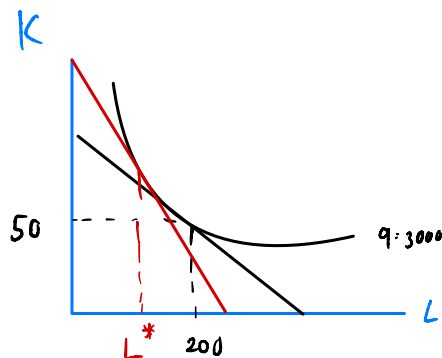
firm can minimize cost by utilized all of production in order to produce

2.b) At the equilibrium in part a., what is the marginal product (MP_L) of the 200th workers?

$$MP_{L, 200} = 3000 = \frac{MP_L}{8}$$

$$= 24,000$$

2.c) Suppose that the input price for L increases to \$15 per unit, while the input price for K and the required amount of output are the same. Draw another diagram to illustrate the change in the least-cost input combination.



2.d) Explain the difference between short-run and long-run production.

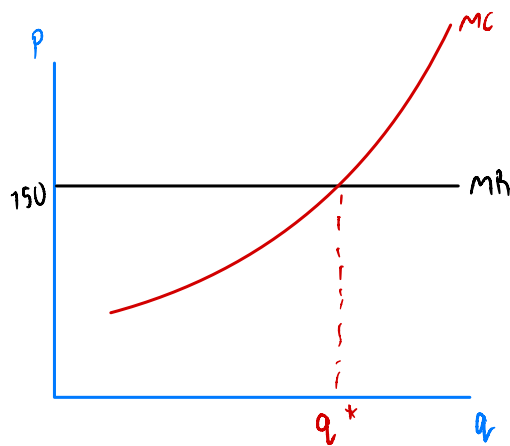
Short run refers to the production
the one factor is fixed but in the
long-run production refers to all factors
are variable.

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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.



profit maximizing is when
 $MR = MC$

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.

$$TR = P \times Q = 150 \times 20 = 3000$$

$$TC = 180 \times 20 = 3600$$

$$\text{Profit} = TR - TC = 3000 - 3600 = -600$$

$$AVC = \frac{TVC}{Q}$$

$$AFC = 60 \Rightarrow \frac{TFC}{Q} = 60$$

$$TFC = 60 \times 20 = 1200$$

$$TC = 3600 = TVC + 1200$$

$$TVC = 2400$$

$$AVC = \frac{2400}{20} = 120$$

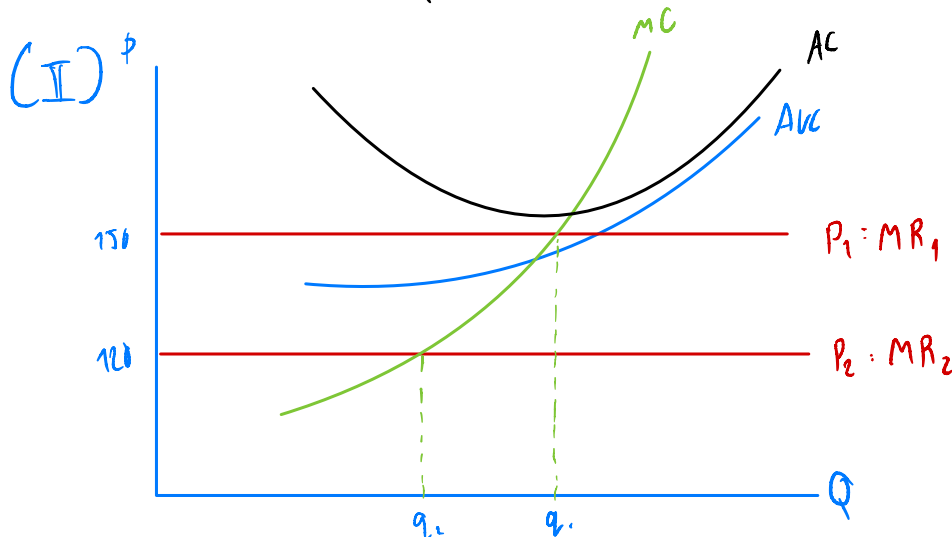
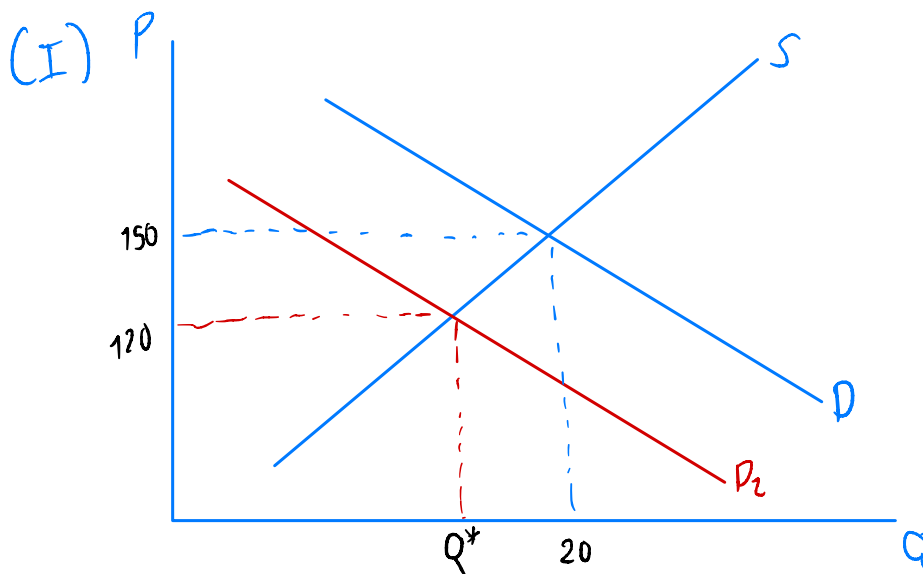
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3.c) From part b., should this firm stay in the market in the short run? Justify your answer.

firm should stay in the market in the short run because
 firm are expect to receive profit in the long run
 if they choosing a unit and produce up to q^*

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?



P decrease to 120
 make MR decrease
 so the equilibrium of
 quantity and profit
 decrease