# Introduction to Microeconomics

## Week 9

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March 26, 2024

# Question 1

Which statements about cost are true?

A) Total cost is the product of average total cost and the quantity produced.

B) Total cost is the sum of each short run marginal cost of all units produced.

C) Average total cost is the sum of average fixed cost and average variable cost.

D) Average fixed cost is always declining with quantity produced in the short run.

E) Total cost is always declining with quantity produced.

# Question 2

Joe quits his computer programming job, where he was earning a salary of $50,000$ per year, to start his own computer software business in a building that he owns and was previously renting out for $24,000$ per year. In his first year of business he has the following expenses: salary paid to himself, $40,000$; rent, $0$; other expenses, $25,000$. Find the accounting cost and the economic cost associated with Joe's computer software business.

# Question 3

A firm buys a forklift for $25000. One year later, the firm finds that it is possible to sell the forklift for $25000 since the forklift is practically unused. Two years later, the firm finds that they can sell the forklift for $10000. Three years later, the firm finds that the forklift cannot be sold. Which of the following statements is/are correct?

A) One year later, the opportunity cost of the forklift is $25000.

B) One year later, the sunk cost of the forklift is $25000.

C) Two years later, the sunk cost of the forklift is $15000.

D) Three years later, the implicit cost of the forklift is $25000.

E) Three years later, the sunk cost of the forklift is $25000.

# Question 4

In the short run, how are marginal cost and the marginal product of inputs related?

A) $MC = w \cdot MP_L$

B) $MC = w/MP_L$

C) $MC = r \cdot MP_K$

D) $MC = r/MP_K$

Suppose $q = \sqrt{K} + \sqrt{L}$, $r = 5$ and $w = 50$. How much labor will the firm use to produce $q = 110$, if it minimizes costs?

A) $L = 100$

B) $L = 50$

C) $L = 10$

D) $L = 200$

# Question 6

What costs are "fixed" even in the long run?

A) Fixed costs

B) Variable costs

C) Sunk costs

D) Marginal costs

E) Total costs

F) None of the above.

# Question 7

A firm's production function is given by $q = min\{aK, bL\}$ where $a > 0, b > 0$. The rental rate of capital is $r$ and wages are $w$ per unit time each. What is the cost function of this firm?

A) $C = (\frac{a}{r} + \frac{b}{w}) \cdot q$

B) $C = (\frac{r}{a} + \frac{w}{b}) \cdot q$

C) $C = (ar + wb) \cdot q$

D) $C = min\{\frac{r}{a} + \frac{w}{b}\} \cdot q$

# Question 8

A firm has a production function given by $q = (L^\rho + K^\rho)^{1/\rho}$. Then, if $\rho = 0.5, w = r = 1$, and $q = 4$, solve for the cost-minimizing L and K.

A) $L = 1, K = 2$

B) $L = K = 1$

C) $L = 1/2, K = 1$

D) $L = 1, K = 1/2$

# Reference Reading

1. *The Economy 2.0: Microeconomics* by CORE Econ.

2. *Introduction to Economic Analysis v. 1.0*

3. *Workouts in Intermediate Microeconomics 6e* by Hal Varian

4. *Microeconomics* by Jeffrey Perloff

5. *Microeconomics* by Pindyck and Rubenfield