

Econ 101 Discussion Section

Worksheet 10: Chapter 13 and Chapter 14

Review of Concepts:

- Productivity
- Marginal Product of Labor
- Costs: Total, Fixed, Variable, Average, Marginal
- Perfect Competition
- Profit Maximization
- Equilibrium in Perfect Competition

Practice Exercises: Short Answers

1. The Silph Company employs workers to make scopes. The following table shows the short-run relationship for the company between workers employed and scopes produced. You are told that the wage for each worker is \$10 and that the raw material to make a single scope costs \$20.

Quantity Variable of Input: Labor	Quantity of Output: Scopes	FC	VC	TC	AFC	AVC	ATC	MC	MPL
0	0				---	---	---	---	---
1	1								
2	2						80		
3	3								
5	4								
8	5								
13	6								
21	7								
34	8								

a) Fill out the table above using the given information.

b) Does Silph Co. experience diminishing returns to labor? Use the last column of the table to answer this question.

c) Assume that Silph Co. is in a perfectly competitive market for scopes, and the current market price for one scope is \$60. How many scopes should Silph Co. produce? How many workers does it hire? Does the company make a profit?

d) In the long run, what is the minimum price for one scope such that the company could stay open?

2. Consider the taco stands on State Street. Suppose that the taco market on State Street is a perfect competitive market, where all taco stands are exactly the same (i.e. producing the exact same tacos and having the exact same cost features). The market demand for tacos is given by the demand curve where P is the price per taco and Q is the market quantity of tacos:

$$P = 100 - 2Q$$

Each taco stand faces a marginal cost curve given by the following equation where q is the quantity of tacos produced by the firm:

$$MC = 4q$$

and a total cost curve given by:

$$TC = 2q^2 + 8$$

- a) For each taco stand, what is the fixed cost (FC)? What is the average fixed cost (AFC) curve and the average total cost (ATC) curve?
- b) What is the break-even price for each taco stand?
- c) What is the shut-down price? (For simplicity, assume that q does not need to be an integer)
- d) Assume that the current price for one taco on State Street is \$10. How many tacos does each taco stand produce? Suppose that there is no cost in setting up/closing down a taco stand. Will we witness entry of new taco stands into the market, or exit of existing stands from the market?
- e) Imagine that you are one of the taco stand owners. The current price for one taco has dropped from \$10 to \$7. Describe what you would do in the short run and in the long run.
- f) In the long run, what would the price for one taco be on State Street? How many taco stands will stay in the market?

Practice Exercises: Multiple Choice

Table 1

The following table shows the production costs for The Flying Elvis Copter Rides.

Output (Helicopter rides)	Total Cost (Dollars)	Fixed Cost (Dollars)	Variable Cost (Dollars)	Marginal Cost (Dollars)	Average Fixed Cost (Dollars per ride)	Average Variable Cost (Dollars per ride)	Average Total Cost (Dollars per ride)
0	50	50	0	--	--	--	--
1	150	A	B	C	D	E	F
2	G	H	I	120	J	K	L
3	M	N	O	P	Q	120	R

- 1. Refer to Table 1.** What is the value of A?
 - a. \$25
 - b. \$50
 - c. \$100
 - d. \$200

- 2. Refer to Table 1.** What is the value of F?
 - a. \$50
 - b. \$100
 - c. \$150
 - d. \$200

- 3. When a factory is operating in the short run,**
 - a. it cannot alter variable costs.
 - b. total cost and variable cost are usually the same.
 - c. average fixed cost rises as output increases.
 - d. it cannot adjust the quantity of fixed inputs.

Indicate whether the statement is true or false.

4. If the marginal cost of producing the tenth unit of output is \$2.50, and if the average total cost of producing the tenth unit of output is \$3, then at ten units of output, average total cost is rising.

- a. True
- b. False

5. Economists include both explicit and implicit costs while accountants include only implicit costs.

- a. True
- b. False

Table 2

Listed in the table are the long-run *total* costs for three different firms.

Quantity	1	2	3	4	5
Firm A	100	100	100	100	100
Firm B	100	200	300	400	500
Firm C	100	300	600	1,000	1,500

6. **Refer to Table 2.** Firm B is experiencing constant returns to scale.

- a. True
- b. False

7. **Refer to Table 2.** Firm B is experiencing diseconomies of scale.

- a. True
- b. False

Indicate the answer choice that best completes the statement or answers the question.

Scenario 1

Assume a certain firm in a competitive market is producing $Q = 1,000$ units of output. At $Q = 1,000$, the firm's marginal cost equals \$15 and its average total cost equals \$11. The firm sells its output for \$12 per unit.

8. **Refer to Scenario 1.** At $Q = 1,000$, the firm's profits equal
- \$200.
 - \$1,000.
 - \$3,000.
 - \$4,000.

Scenario 2

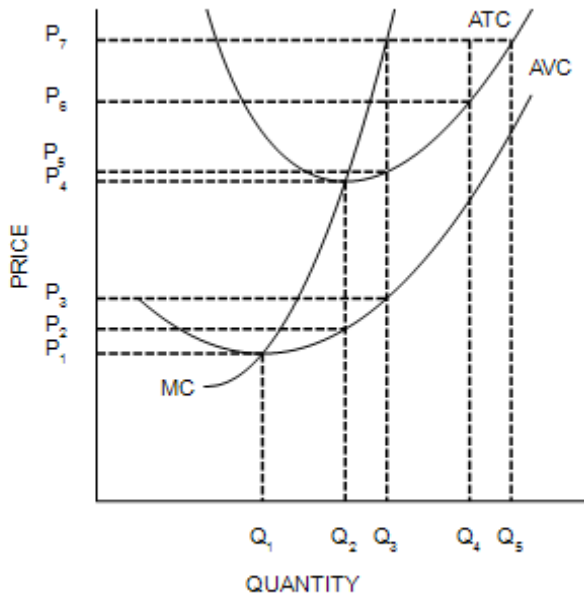
The information below applies to a competitive firm that sells its output for \$45 per unit.

- When the firm produces and sells 100 units of output, its average total cost is \$24.5.
- When the firm produces and sells 101 units of output, its average total cost is \$24.65.

9. **Refer to Scenario 2.** Suppose the firm is producing 100 units of output and its fixed cost is \$900. Then its variable cost amounts to
- \$9,360.25.
 - \$7,500.00.
 - \$2,450.00.
 - \$1,550.00.
10. When new firms enter a perfectly competitive market,
- economic profits of existing firms will continue to be zero.
 - entering firms will earn zero economic profit upon entry into the market.
 - existing firms may see their costs rise if more firms compete for limited resources.
 - prices will rise as existing firms raise prices to keep new firms out of the market.

Figure 1

Suppose a firm operating in a competitive market has the following cost curves:



11. **Refer to Figure 1.** When market price is P_7 , a profit-maximizing firm's short-run profits can be represented by the area

- a. $P_7 \times Q_5$.
- b. $P_7 \times Q_3$.
- c. $(P_7 - P_5) \times Q_3$.
- d. We are unable to determine the firm's profits because the quantity that the firm would produce is not labeled on the graph.

12. **Refer to Figure 1.** In the short run, if the market price is P_4 , individual firms in a competitive industry will earn

- a. positive profits.
- b. zero profits.
- c. losses but will remain in business.
- d. losses and will shut down.

13. **Refer to Figure 1.** When market price is P_2 , a profit-maximizing firm's losses can be represented by the area

- a. $(P_4 - P_2) \times Q_2$.
- b. $(P_2 - P_1) \times (Q_2 - Q_1)$.
- c. At a market price of P_2 , the firm earns profits, not losses.
- d. At a market price of P_2 the firm has losses, but the reference points in the figure don't identify the losses.

Works Cited:

- Mankiw, Gregory. *Principles of Microeconomics*. 9th ed. Cengage Learning. 2021
- <https://www.ssc.wisc.edu/~ekelly/econ101/>