

University of Lethbridge – Department of Economics  
ECON 1010 – Introduction to Microeconomics  
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**Lab #10**

**Chapter 10 — Output and Costs**

- 1) The short run is a period of time in which
- A) the firm is not able to hire more workers.
  - B) the amount of output produced is fixed.
  - C) there is a shortage of most resources.
  - D) the quantities of some resources are fixed, and others can be varied.
  - E) There is not enough time to make all of the decisions.

Answer: D

- 2) The long run is a period of time in which
- A) the firm can hire all the workers it wants to employ, but it does not have sufficient time to buy more equipment.
  - B) the firm is able to maximize total profit.
  - C) the firm may want to build a bigger plant, but cannot do so.
  - D) economic efficiency is achieved.
  - E) the quantities of all resources can be varied.

Answer: E

- 3) Fixed inputs are those inputs
- A) that are too expensive for the firm to purchase.
  - B) that must be held in storage for at least one year.
  - C) whose quantity used cannot be changed in the short run.
  - D) in which the marginal product of the last unit of the input employed exceeds the marginal product of the previous unit.
  - E) which can be purchased only in fixed quantity lots (e.g., 200 at a time).

Answer: C

- 4) The total product curve is a graph of the
- A) minimum cost of producing a given amount of output using different techniques.
  - B) maximum profit attainable for each unit of output sold.
  - C) maximum output attainable for each quantity of variable input employed.
  - D) minimum output attainable for each quantity of variable input employed.
  - E) change in total product for a change in marginal product.

Answer: C

Use the figure below to answer the following question(s).

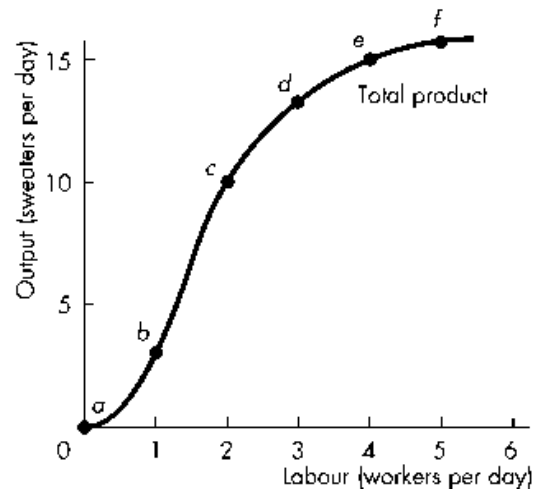


Figure 10.1

5) Refer to Figure 10.1 which illustrates Swanky's total product curve. Which one of the following statements is *false*?

- A) All the points above the curve are unattainable.
- B) All the points below the curve are attainable.
- C) All the points below the curve are inefficient.
- D) All the points on the curve involve equal cost to the firm.
- E) All the points on the curve are attainable.

Answer: D

6) Refer to Figure 10.1 which illustrates Swanky's short-run total product curve. Which one of the following statements is *true*?

- A) The points above the curve are attainable and inefficient.
- B) The points below the curve are attainable and inefficient.
- C) The points below the curve are inefficient and unattainable.
- D) The points on the curve are efficient and unattainable.
- E) All the points on the curve have equal marginal products.

Answer: B

7) Marginal product is the change in total product caused by a

- A) one-unit increase in the variable input, holding the quantity of fixed input constant.
- B) one-unit increase in the quantity of fixed input employed, holding the quantity of the variable input constant.
- C) one-unit increase in both the quantity of variable and fixed inputs.
- D) change in the cost of the variable input.
- E) 1 percent change in the amount of variable input used.

Answer: A

Use the table below to answer the following question(s).

**Table 10.1**

Labour (workers per day)	Output (sweaters per day)
0	0
1	3
2	12
3	19
4	23
5	25

- 8) Refer to Table 10.1 which represents Swanky's total product curve. The marginal product that would be produced if the firm employed four workers is

A) 6.  
B) 2.  
C) 9.  
D) 7.  
E) 4.

Answer: E

Use the table below to answer the following question(s).

**Table 10.2**

Labour (workers per day)	Output (sweaters per day)
0	0
1	2
2	8
3	12
4	15
5	16

- 9) Refer to Table 10.2 which represents Swanky's total product curve. The average product that would be produced if the firm employed four workers is

A) 2.  
B) 8.  
C) 12.  
D) 15.  
E) 3.75.

Answer: E

- 10) Suppose a 1-unit rise in labour input, from 2 to 3 workers, increases output from 10 to 15 sweaters. The marginal product of the third worker is
- A) 1.
  - B) 3.
  - C) 4.
  - D) 5.
  - E) 15.

Answer: D

- 11) Suppose a firm increases the total units of labour employed from 5 to 6 workers, and as a result, the firm's total output increases from 100 units to 400 units. The marginal product of the sixth worker is
- A) 50.
  - B) 100.
  - C) 200.
  - D) 300.
  - E) 66.67.

Answer: D

- 12) Marginal product
- A) is always negative.
  - B) is the slope of the total product curve.
  - C) is always zero.
  - D) lies between zero and one.
  - E) is average product minus total product.

Answer: B

- 13) If the total product of three workers is 214 and the total product of four workers is 221, then the marginal product of the fourth worker is
- A) 71.3
  - B) 55.25
  - C) 7
  - D) 62.14
  - E) 1.75

Answer: C

- 14) Diminishing marginal returns refers to a situation where the \_\_\_\_\_ of the last worker hired falls short of the \_\_\_\_\_ of the previous worker.
- A) marginal cost; marginal cost
  - B) average cost; average cost
  - C) marginal product; marginal product
  - D) average product; average product
  - E) marginal product; average product

Answer: C

- 15) When the marginal product of labour is greater than the average product of labour,
- A) the average product of labour is increasing.
  - B) the marginal product of labour is increasing.
  - C) the total product curve is negatively sloped.
  - D) the firm is experiencing diminishing marginal returns.
  - E) the firm is experiencing constant returns.

Answer: A

Use the figure below to answer the following question(s).

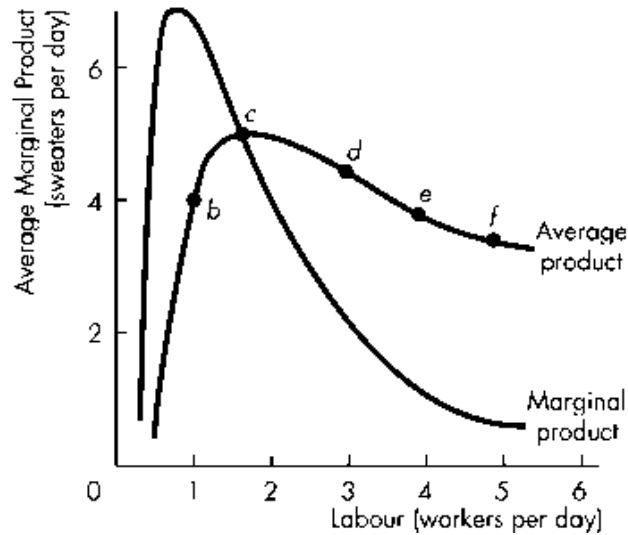


Figure 10.3

- 16) Refer to Figure 10.3 which illustrates Swanky's average product curve. The point of maximum average product is point
- A) *b*.
  - B) *c*.
  - C) *d*.
  - D) *e*.
  - E) *f*.

Answer: B

- 17) If energy (*E*) is the only input used to produce output (*Q*), what is the formula for average product of energy?
- A)  $\Delta Q/\Delta E$
  - B)  $Q/E$
  - C)  $\Delta E/\Delta Q$
  - D)  $E/Q$
  - E)  $Q \cdot E$

Answer: B

- 18) If energy (E) is the only input used to produce output (Q) , what is the formula for marginal product of energy?
- A)  $Q \cdot E$
  - B)  $Q/E$
  - C)  $\Delta Q/\Delta E$
  - D)  $\Delta E/\Delta Q$
  - E)  $E/Q$

Answer: C

- 19) Suppose the marginal product of energy is less than the average product of energy. This implies that
- A) the marginal product is equal the average product.
  - B) the marginal product is greater than the average product at each level of the input used.
  - C) the marginal product curve is upward sloping.
  - D) the average product curve is upward sloping.
  - E) both the marginal and average product curves are decreasing.

Answer: E

- 20) Suppose the marginal product of energy equals the average product of energy. This implies that
- A) marginal product is negative.
  - B) average product is maximized.
  - C) marginal product is maximized.
  - D) the marginal product curve is upward sloping.
  - E) average product is minimized.

Answer: B

- 21) Which one of the following statements is correct?
- A) When marginal product is increasing, average product is decreasing.
  - B) When average product is below zero, marginal product remains positive.
  - C) When marginal product is increasing, average product is increasing.
  - D) When marginal product is zero, total product is minimized.
  - E) When average product exceeds marginal product, both curves are upward sloping.

Answer: C

- 22) The average product of energy is
- A) the increase in total product divided by the increase in energy used.
  - B) the total product divided by the quantity of energy used.
  - C) the slope of the total product curve.
  - D) the slope of the marginal product curve.
  - E) the difference between the total product and marginal product of energy.

Answer: B

- 23) Which of the following statements by a restaurant owner refers to the law of diminishing marginal returns?
- A) "The higher the quality of the ingredients we use, the higher the cost of producing each meal."
  - B) "If we double the size of our premises and double everything else—kitchen staff, serving staff, equipment—we can increase the number of meals we serve, but not to double current levels."
  - C) "We can increase the number of meals we serve by just adding more kitchen staff, but each additional worker adds less meals than the previous worker because traffic in the kitchen will get worse."
  - D) "We can serve the same number of meals with fewer kitchen staff, but we would have to buy more labour-saving kitchen equipment."
  - E) "We can serve the same number of meals with less kitchen equipment, but we would have to hire more kitchen staff."

Answer: C

- 24) Total fixed cost can be defined as
- A)  $TFC = TC/Q$ .
  - B)  $TFC = TC - AVC$ .
  - C)  $TFC = TC - TVC$ .
  - D)  $TFC = TVC/Q$ .
  - E)  $TFC = TVC - TC$ .

Answer: C

- 25) Marginal cost is calculated as
- A) total cost divided by output.
  - B) the increase in total cost divided by the increase in output.
  - C) the increase in total cost divided by the increase in labour input, given the amount of capital.
  - D) total variable cost minus total fixed cost.
  - E) the increase in total cost divided by the increase in variable cost.

Answer: B

Use the table below to answer the following question(s).

**Table 10.5**

Labour (workers/day)	Output (sweaters/day)	TFC	TVC	TC
0	0	20	0	20
1	4	20	--	45
2	9	20	--	70
3	13	20	--	95
4	16	20	100	--
5	18	20	125	145

- 26) Refer to Table 10.5, which represents Swanky's short-run total cost schedule. The average fixed cost of producing 9 sweaters per day is

A) \$2.22.  
B) \$1.25.  
C) \$10.00.  
D) \$1.11.  
E) \$1.54.

Answer: A

- 27) Refer to Table 10.5, which represents Swanky's short-run total cost schedule. The average total cost of producing 16 sweaters per day is

A) \$2.  
B) \$5.  
C) \$3.33.  
D) \$7.50.  
E) \$5.51.

Answer: D

- 28) Refer to Table 10.5, which represents Swanky's short-run total cost schedule. When output goes up from 4 to 9 sweaters, the marginal cost of one of the 5 sweaters is

A) \$4.25.  
B) \$4.  
C) \$25.  
D) \$6.25.  
E) \$5.

Answer: E



Use the figure below to answer the following question(s).

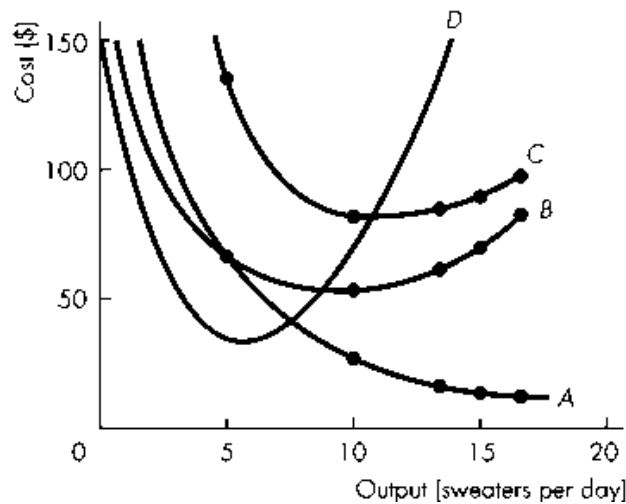


Figure 10.5

29) Refer to Figure 10.5, which illustrates the short-run average and marginal cost curves. The average variable cost curve is represented by the curve labelled

- A) A.
- B) B.
- C) C.
- D) D.
- E) none of the above.

Answer: B

30) Average variable cost is at a minimum at the same output at which

- A) average product is at a maximum.
- B) average product is at a minimum.
- C) marginal product is at a maximum.
- D) marginal product is at a minimum.
- E) marginal cost is at a minimum.

Answer: A

31) The range over which average variable cost is decreasing is the same as the range over which

- A) marginal cost is increasing.
- B) average fixed cost is decreasing.
- C) marginal product is decreasing.
- D) average product is decreasing.
- E) average product is increasing.

Answer: E

32) The vertical distance between the  $TC$  and  $TVC$  curves is

- A) decreasing as output increases.
- B) increasing as output increases.
- C) equal to  $AFC$ .
- D) equal to  $TFC$ .
- E) equal to  $MC$ .

Answer: D

33) The marginal cost ( $MC$ ) curve intersects the

- A)  $ATC$ ,  $AVC$ , and  $AFC$  curves at their minimum points.
- B)  $ATC$  and  $AFC$  curves at their minimum points.
- C)  $AVC$  and  $AFC$  curves at their minimum points.
- D)  $ATC$  and  $AVC$  curves at their minimum points.
- E)  $TC$  and  $TVC$  curves at their minimum points.

Answer: D

34) Marginal cost is the amount that

- A) total cost increases when one more labourer is hired.
- B) fixed cost increases when one more labourer is hired.
- C) variable cost increases when one more labourer is hired.
- D) total cost increases when one more unit of output is produced.
- E) fixed cost increases when one more unit of output is produced.

Answer: D

35) Marginal cost can be specified as

- A)  $Q/TVC$ .
- B)  $\Delta TFC/\Delta TC$ .
- C)  $\Delta TC/\Delta Q$ .
- D)  $Q/TVC$ .
- E)  $(TC-TVC)/Q$ .

Answer: C

36) If  $ATC$  is falling, then  $MC$  must be

- A) rising.
- B) falling.
- C) equal to  $ATC$ .
- D) above  $ATC$ .
- E) below  $ATC$ .

Answer: E

37) If  $ATC$  is rising then  $MC$  must be

- A) rising.
- B) falling.
- C) equal to  $ATC$ .
- D) above  $ATC$ .
- E) both A and D.

Answer: E

38) The  $AFC$  curve shifts upward if

- A) factor prices rise.
- B) a new technology is introduced.
- C) more workers are hired.
- D) all of the above.
- E) none of the above.

Answer: E

39) If  $AFC$  is falling then  $MC$  must be

- A) rising.
- B) falling.
- C) above  $AFC$ .
- D) below  $AFC$ .
- E) none of the above.

Answer: E

40) If  $MC$  is rising then  $ATC$  must be

- A) rising.
- B) falling.
- C) above  $MC$ .
- D) below  $MC$ .
- E) none of the above.

Answer: E

41) In the long run,

- A) only the scale of plant is fixed.
- B) all resources are variable.
- C) all resources are fixed.
- D) a firm must experience decreasing returns to scale.
- E) none of the above is true.

Answer: B

- 42) Economies of scale are present when the percentage change in a firm's output
- A) exceeds the percentage change in its inputs.
  - B) is less than the percentage change in its inputs.
  - C) is increasing.
  - D) is decreasing.
  - E) is constant.

Answer: A

- 43) Suppose a candy manufacturer could triple its production of fudge by doubling its production facility for making fudge. This indicates the presence of
- A) constant returns to scale.
  - B) economies of scale.
  - C) diseconomies of scale.
  - D) market constraints.
  - E) the law of diminishing returns.

Answer: B

- 44) Constant returns to scale occurs if when all inputs are increased at the same rate,
- A) total output remains constant.
  - B) average total cost remains constant.
  - C) average total cost increases at the same rate as inputs.
  - D) long-run average cost remains constant.
  - E) long-run average cost rises at the same rate as inputs.

Answer: D

- 45) Suppose General Motors could triple its production of Cavaliers by tripling its production facility for those cars. This indicates the presence of
- A) constant returns to scale.
  - B) economies of scale.
  - C) diseconomies of scale.
  - D) the law of diminishing returns.
  - E) minimum efficient scale.

Answer: A

Use the figure below to answer the following question(s).

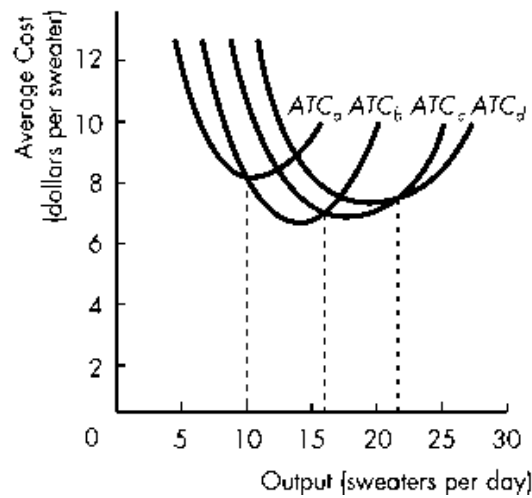


Figure 10.7

- 46) Refer to Figure 10.7, which illustrates the short-run average total cost curves for four different plant sizes. Which curve represents the average total cost for the largest of the four plant sizes?
- A)  $ATC_a$
  - B)  $ATC_b$
  - C)  $ATC_c$
  - D)  $ATC_d$
  - E) either  $ATC_c$  or  $ATC_d$

Answer: D

- 47) Refer to Figure 10.7, which illustrates the short-run average total cost curves for four different plant sizes. Which plant has the lowest average total cost for an output rate of 5 sweaters a day?
- A) Plant *a*
  - B) Plant *b*
  - C) Plant *c*
  - D) Plant *d*
  - E) none of the above

Answer: A

Use the figure below to answer the following question(s).

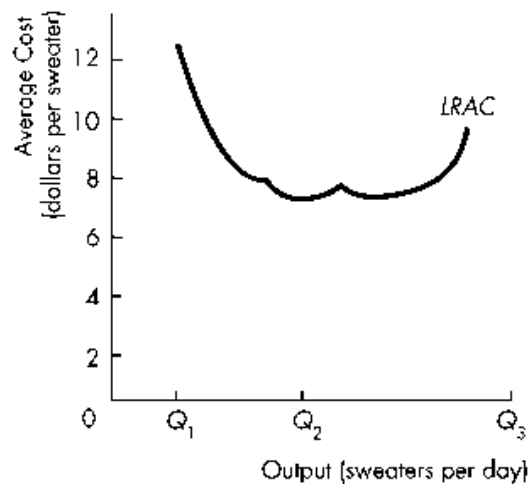


Figure 10.8

- 48) Refer to Figure 10.8 which illustrates a firm's long-run average total cost of production. An increase in production from  $Q_1$  to  $Q_2$  sweaters per day will result in
- A) minimum efficient scale.
  - B) economies of scale.
  - C) diseconomies of scale.
  - D) constant total costs.
  - E) constant returns to scale.

Answer: B

Use the figure below to answer the following question(s).

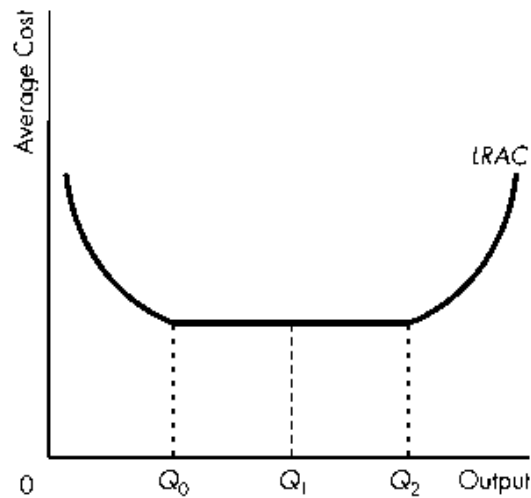


Figure 10.9

- 49) Refer to Figure 10.9, which illustrates the long-run average total cost of production when there is an infinite number of plant sizes and output ranges. Given an increase in output from  $Q_1$  to  $Q_2$ ,
- A) returns to scale are increasing.
  - B) returns to scale are decreasing.
  - C) returns to scale are constant.
  - D) diminishing returns begin to occur.
  - E) there are diseconomies of scale.

Answer: C

- 50) Complete the following sentence. Long-run total cost is
- A) the same as long-run total variable cost.
  - B) the same as long-run total fixed cost.
  - C) equal to long-run total fixed cost plus long-run variable cost.
  - D) equal to long-run total fixed cost minus long-run variable cost.
  - E) equal to short-run total cost.

Answer: A