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1.

Quantity	Marginal Cost	Fixed Cost
0	—	20
1	15	—
2	10	—
3	15	—

According to the table above, which shows the costs of production for a firm, the average total cost of producing 3 units of output is

(A) 5.00
(B) 11.67
(C) 13.33
(D) 15.00
(E) 20.00

2. As output of a firm increases, the difference between the firm's average total cost and its average variable cost gets smaller because the firm's

(A) total cost is increasing
(B) marginal cost is increasing
(C) average fixed cost is decreasing
(D) marginal product of labor is decreasing
(E) long-run average total cost is decreasing

3. Which of the following MUST be true of the long run?

(A) It is at least one year in duration.
(B) All factors of production are variable.
(C) At least one factor of production is fixed.
(D) Marginal costs are constant.
(E) Average total costs are constant.

4. Suppose a firm's production process exhibits diseconomies of scale. How and why will costs change if the firm reduces its output?

(A) Long-run average total cost will increase because it becomes more difficult for the firm to manage its workforce.
(B) Long-run average fixed costs will increase because the firm produces fewer units of output.
(C) Long-run average total cost will decrease because it becomes easier for the firm to manage its workforce.
(D) Long-run average fixed costs will decrease because the firm produces fewer units of output.
(E) Long-run average total cost will decrease because it becomes more difficult for the firm to manage its workforce.

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5. Which of the following is true for a firm that uses labor as a variable input and capital as a fixed input in the short run?

(A) If the marginal product of labor is negative, the average product of labor must also be negative.

(B) If the marginal product of labor is rising, the average product of labor must be greater than the marginal product of labor.

(C) If the average product of labor is rising, the marginal product of labor must be rising.

(D) If the average product of labor is falling, the marginal product of labor must be less than the average product of labor.

(E) The average product of labor can never be equal to the marginal product of labor.

6. What does the minimum efficient scale measure?

(A) The smallest output level at which short-run average total cost is minimized.

(B) The smallest output level at which short-run total cost is minimized.

(C) The smallest output level at which long-run average total cost is minimized.

(D) The largest output level at which long-run average total cost is minimized.

(E) The largest output level at which long-run total cost is minimized.

7. In the short run, which of the following is true of a firm's average total cost of production?

(A) It is equal to marginal cost plus average variable cost.

(B) It is equal to marginal cost plus average fixed cost.

(C) It is equal to average fixed cost plus average variable cost.

(D) It always increases when a firm increases production.

(E) It is zero if the firm shuts down.

8. Which of the following must be true if at the tenth unit of output, marginal cost (MC) is $\$130$ and average total cost (ATC) is $\$150$?

(A) ATC of producing the ninth unit is higher than $\$150$.

(B) ATC of producing the ninth unit is less than $\$150$.

(C) MC of producing the ninth unit is higher than $\$130$.

(D) The average variable cost of producing the tenth unit is higher than $\$150$.

(E) The average variable cost of producing the tenth unit is equal to $\$20$.

9. Which of the following is true about a firm's average variable cost?

(A) It will rise if marginal cost is less than average variable cost.

(B) It will never equal the firm's marginal cost.

(C) It will decline when the firm's marginal product declines.

(D) It will be negative if marginal revenue declines.

(E) It will equal average total cost when fixed costs are zero.

10. Which of the following is always true of the relationship between average and marginal costs?

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(A) Average total costs are increasing when marginal costs are increasing.
(B) Marginal costs are increasing when average variable costs are higher than marginal costs.
(C) Average variable costs are increasing when marginal costs are increasing.
(D) Average variable costs are increasing when marginal costs are higher than average variable costs.
(E) Average total costs are constant when marginal costs are constant.

The following questions are based on the table below, which shows a firm's average variable cost and average total cost.

Output	Average Variable Cost	Average Total Cost
1	$40	$160
2	35	95
3	40	80
4	45	75
5	50	74
6	55	75

11. The average fixed cost of producing four units of output is equal to

(A) $120
(B) $95
(C) $75
(D) $50
(E) $30

12.

Units of Labor Input	Units of Output
1	8
2	20
3	30

The table above shows the amount of labor inputs necessary to produce given levels of output. If the cost of a unit of labor is $20 and total fixed cost is $100, the average total cost of producing 20 units of output is

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(A) $1
(B) $2
(C) $7
(D) $40
(E) $120

13. Assume that total fixed costs are $46, that the average product of labor is 5 units when 10 units of output are produced, and that the wage rate is $12. If labor is the only variable input, what is the average total cost of producing 10 units of output?

(A) $2
(B) $5
(C) $7
(D) $9
(E) $12

The following questions are based on the table below, which gives cost information for a perfectly competitive firm.

Quantity	Average Fixed Costs	Average Variable Costs	Marginal Costs
0			
1	$100.00	$55.00	$55.00
2	50.00	45.00	35.00
3	33.33	50.00	60.00
4	25.00	55.00	70.00
5	20.00	60.00	80.00
6	16.67	65.00	90.00

14. The average total cost to the firm of producing 2 units of output is

(A) $35.00
(B) $85.00
(C) $95.00
(D) $100.00
(E) $130.00

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15.

Units of Labor	Quantity of Output	Total Cost
0	0	$100
1	10	$120
2	25	$150

Given the information above, the average variable cost of 25 units of output is

(A) $2
(B) $6
(C) $25
(D) $50
(E) $75

16. At 100 units of output, a firm's total cost is $10,000. If the firm's total fixed cost is $4,000, its average variable cost is equal to

(A) $140
(B) $100
(C) $60
(D) $40
(E) $0

17. If the marginal cost of producing the first unit of some good is $20 and the marginal cost of producing the second unit is $30, the average variable cost of producing 2 units is

(A) $5
(B) $10
(C) $20
(D) $25
(E) $50

h

18.

Quantity (units)	Total Cost
0	$30
1	40
2	47
3	51
4	59

The table above shows a firm's total cost of producing various units of output. What is the average variable cost of producing three units?

(A) $4
(B) $7
(C) $10
(D) $17
(E) Cannot be determined from the given information

19. The table below shows a competitive firm's total variable cost (TVC) and total fixed cost (TFC) at various units of output.

Output	TVC	TFC
0	0	9
1	3	9
2	8	9
3	15	9
4	26	9
5	38	9

When output is 3 units, which of the following is correct?

h

(A)

Average Variable Cost	Marginal Cost
5	6

(B)

Average Variable Cost	Marginal Cost
5	7

(C)

Average Variable Cost	Marginal Cost
6	5

(D)

Average Variable Cost	Marginal Cost
7	7

(E)

Average Variable Cost	Marginal Cost
7	6

20. A firm is producing 100 units of output at a total cost of $400. The firm's average variable cost is $3 per unit. What is the firm's total fixed cost?

(A) $1
(B) $50
(C) $100
(D) $300
(E) $400

h

The following question is based on the output and cost data in the table below.

Quantity of Output Produced (units)	Total Variable Cost ($)	Total Cost ($)
1	100	200
2	190	290
3	270	370
4	340	440
5	420	520
6	510	610
7	610	710

21. According to the cost schedule in the table above, the firm's total fixed cost is

(A) increasing
(B) decreasing
(C) $90
(D) $100
(E) impossible to determine

22. If there is only one variable input, diminishing marginal returns first occur with the production of which unit of output?

(A) 7th
(B) 6th
(C) 5th
(D) 4th
(E) 3rd

h

23.

Quantity of Output (units)	Total Variable Cost
0	$0
1	$40
2	$50
3	$65
4	$90

Assume that the fixed cost is $50. Based on the cost and output data in the table above, what is the marginal cost when the firm increases its output from three to four units and the average total cost of producing 4 units?

h

(A)

Marginal Cost	Average Total Cost
$35	$40

(B)

Marginal Cost	Average Total Cost
$35	$35

(C)

Marginal Cost	Average Total Cost
$25	$35

(D)

Marginal Cost	Average Total Cost
$25	$25

(E)

Marginal Cost	Average Total Cost
$10	$25

24. Assume that a profit-maximizing firm is perfectly competitive in both the output and the factor markets and is at its long-run equilibrium. The firm's output is 100 units, its total revenue is $600.00, and the fixed cost of production is $50.00. Based on this information, which of the following is true for the firm?

(A) Its marginal cost is $5.50, and its average total cost is $5.50.

(B) Its marginal cost is $5.50, and its average variable cost is $5.50.

(C) Its marginal cost is $6.00, and its average total cost is $5.50.

(D) Its marginal cost is $6.00, and its average fixed cost is $5.50.

(E) Its marginal cost is $6.00, and its average variable cost is $5.50.

h

25. If labor is the only variable input and it costs $15 per hour and if the marginal product of labor is 3 units per hour, the short-run marginal cost of 1 unit of output is approximately

(A) $0.20
(B) $3.00
(C) $5.00
(D) $15.00
(E) $45.00

26. The table below shows a production function for a firm.

Units of Variable Input	Total Product
1	10
2	22
3	40
4	60
5	68
6	74
7	76
8	68
9	50
10	20

All of the following can be concluded from the information in the table EXCEPT:

(A) Diminishing marginal returns set in after the fourth unit of the variable input.
(B) Marginal product is positive if total product is increasing.
(C) This is a production function for a perfectly competitive firm.
(D) A profit-maximizing firm would never voluntarily employ the eighth unit of the variable input.
(E) Total product starts to decrease when marginal product changes from positive to negative.

27. If the output of a firm doubles when the firm doubles all of its inputs, the firm must be experiencing

(A) economies of scale
(B) increasing returns to scale
(C) constant returns to scale
(D) decreasing returns to scale
(E) diseconomies of scale

28. A competitive firm produces a product using labor and plastic. The firm is initially in equilibrium. If the cost of plastic suddenly increases, which of the following will occur?

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(A) The demand curve for the product will shift to the left.

(B) The firm's demand curve for plastic will shift to the left.

(C) The firm will increase the number of units offered for sale.

(D) The firm will definitely go out of business, since competitive firms earn zero economic profits in equilibrium.

(E) The firm's marginal costs will increase at each level of output.

29. With capital held constant, when Zane employs one additional worker, the marginal product of labor decreases by 5 units. Which economic concept best characterizes Zane's production process?

(A) Diminishing marginal returns

(B) Increasing marginal returns

(C) Constant returns to scale

(D) Economies of scale

(E) Diseconomies of scale

30. The table below shows the long-run total cost function of a firm.

Quantity of Output	Total Cost ($)
0	0
1	10
2	20
3	30
4	40
5	50

The firm's cost function exhibits

(A) diseconomies of scale

(B) constant returns to scale

(C) economies of scale

(D) decreasing marginal cost

(E) increasing marginal cost

31. Economies of scale can be illustrated by

(A) an increasing short-run marginal cost curve as a firm produces more output

(B) a decreasing short-run average total cost curve as a firm produces more output

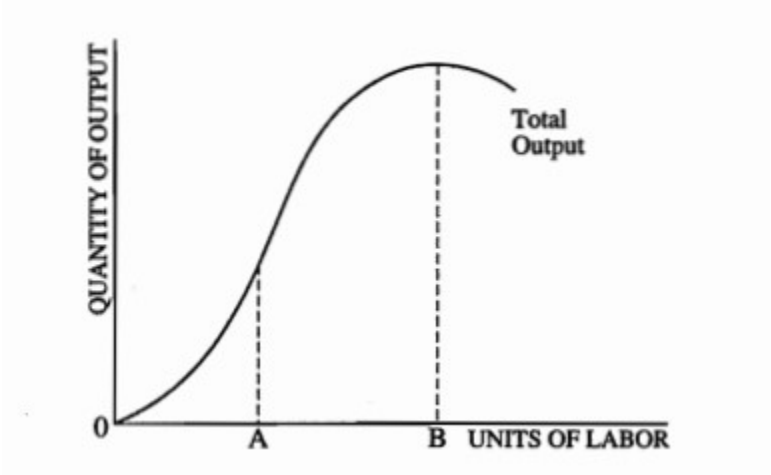
(C) a downward-sloping long-run supply curve for an industry

(D) a decreasing long-run average total cost curve as a firm produces more output

(E) an increasing long-run average total cost curve as a firm produces more output

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32.



The relationship in the graph above best illustrates the economic concept of

(A) opportunity cost
(B) diminishing marginal utility in consumption
(C) diminishing marginal returns in production
(D) production possibilities
(E) comparative advantage

33. If a firm's production function exhibits diminishing marginal product of the variable input in the short run, which of the following about the firm's short-run marginal cost (MC) curve must be true?

(A) As output increases, the MC curve slopes upward.
(B) As output increases, the MC curve slopes downward and becomes flatter.
(C) As output increases, the MC curve slopes downward and becomes steeper.
(D) The MC curve is horizontal.
(E) The MC curve is vertical.

34. Short-run marginal costs eventually increase because of the effects of

(A) increasing marginal product
(B) diminishing marginal product
(C) diseconomies of scale
(D) economies of scale
(E) increasing fixed costs

35. For a firm where labor is the only variable input, which of the following happens when diminishing returns set in?

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(A) Average variable cost begins to increase.
(B) Average product of labor begins to decline.
(C) Total product begins to decline.
(D) Marginal cost begins to increase.
(E) Average total cost begins to increase.

36. Assume that a firm uses only one variable input. If a firm is experiencing diminishing returns, which of the following is true as more of the variable input is used?

(A) Marginal cost will decrease at a constant rate.
(B) Marginal cost will decrease at a diminishing rate.
(C) Marginal cost will increase.
(D) Marginal product will increase at a constant rate.
(E) Marginal product will increase at a diminishing rate.

37. Which of the following indicates the presence of economies of scale as the quantity of output increases?

(A) Average variable cost decreases.
(B) Long-run average total cost decreases.
(C) Marginal cost decreases.
(D) Average fixed cost decreases.
(E) Marginal cost exceeds average total cost.

38. Which of the following must be true if a firm is experiencing economies of scale?

(A) All costs are explicit.
(B) Long-run average total cost decreases as the firm's output increases.
(C) Economic profits decrease as the firm's output increases.
(D) Long-run average total cost remains constant as the firm's output decreases.
(E) Proportionate increases in inputs result in less-than-proportionate increases in output.

39. Economies of scale exist when

(A) the doubling of all inputs doubles the output produced
(B) short-run average total cost decreases as output increases
(C) short-run average total cost remains constant as output increases
(D) long-run average total cost increases as output increases
(E) long-run average total cost decreases as output increases

40. If a firm experiences economies of scale over the entire range of output, the long-run average cost curve will be

h

(A) U-shaped
(B) upward sloping
(C) downward sloping
(D) horizontal
(E) below the marginal cost curve

41. If a firm is experiencing economies of scale, which of the following will decrease as output increases?

(A) Fixed cost
(B) Long-run total cost
(C) Long-run average total cost
(D) Marginal cost
(E) Marginal revenue

42. F&D Manufacturing Company increases all its inputs by 50 percent each. If F&D's output increases by 100 percent, then F&D is experiencing

(A) increasing returns to scale
(B) constant returns to scale
(C) diseconomies of scale
(D) increasing marginal cost
(E) decreasing profits

43.

Number of Workers	Bushels of Apples Picked
0	0
1	4
2	9
3	15
4	20
5	24

The table above shows the short-run production function for picking apples. Based on the production data, which of the following statements about the marginal product of the fifth worker is true?

(A) It is the maximum that can be attained.
(B) It is greater than the marginal product of the first worker due to increasing returns.
(C) It is greater than the combined marginal products of all the other workers.
(D) It is less than the marginal product of the third worker due to diminishing returns.
(E) It is rising due to increasing marginal returns.

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44. Suppose that a firm begins to hire workers for a newly completed plant with a fixed amount of machinery. As the firm hires additional workers, one would expect the marginal product to

(A) fall initially, but eventually rise
(B) rise initially, but eventually fall
(C) rise consistently due to diminishing return
(D) rise consistently due to the advantages of specialization
(E) rise consistently due to economies of scale

45. Currently, XYZ Corporation can produce 50 units of output using 20 workers and 8 units of capital. Which of the following changes in the number of workers, units of capital, and quantity of output are consistent with constant returns to scale?

(A)

Workers	Capital	Output
40	8	100

(B)

Workers	Capital	Output
40	16	90

(C)

Workers	Capital	Output
20	4	25

(D)

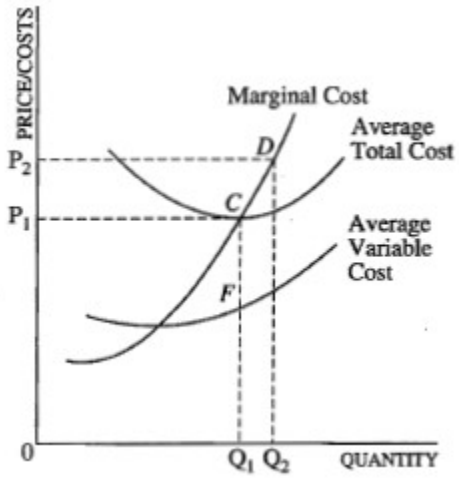
Workers	Capital	Output
10	4	25

(E)

Workers	Capital	Output
10	8	25

h

The following questions refer to the graph below, which shows the cost curves for a profit maximizing, perfectly competitive firm.



46. The vertical distance *CF* represents the

(A) total cost of producing Q_1 units of output
(B) average total cost of producing Q_1 units of output
(C) average fixed cost of producing Q_1 units of output
(D) average variable cost of producing Q_1 units of output
(E) amount of the firm's loss resulting from producing Q_1 units of output

47. If a firm's average total cost decreases as the firm increases its output, the firm's marginal cost must be

(A) greater than the average variable cost
(B) less than the average fixed cost
(C) less than the average total cost
(D) decreasing
(E) negative

48. Which of the following factors can cause a firm's cost curves to shift upward?

(A) An increase in wages
(B) An increase in the firm's output
(C) An increase in the output price
(D) A decrease in the firm's output
(E) A decrease in the price of energy

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49. Which of the following provides an example of the law of diminishing returns?

(A) A farm doubles all its inputs and observes that output less than doubles.

(B) A textile producer's output increases by 5 units when adding a fourth worker and by 7 units when adding a fifth worker.

(C) If a fixed input increases, fewer additional units of a variable input will be needed to increase output by one unit.

(D) As more of a variable input—for example, labor is used with a fixed number of machines— output increases but at a diminishing rate.

(E) More cooks in a single kitchen will increase the number of meals produced by increasing amounts.

50. In the short run, assume diminishing marginal product of labor sets in with the hiring of the second worker. Which of the following will remain constant as a firm produces more output?

(A) Average product of labor

(B) Total cost

(C) Total fixed cost

(D) Total variable cost

(E) Marginal cost

51. At 100 units of a firm's output, average total cost is $10, average variable cost is $8, average fixed cost is $2, and marginal cost is $12. How will each of the following change as the firm's output further increases?

h

(A)

Average Total Cost	Average Variable Cost	Average Fixed Cost
Increase	Increase	Increase

(B)

Average Total Cost	**Average Variable Cost**	**Average Fixed Cost**
Increase	Increase	Decrease

(C)

Average Total Cost	**Average Variable Cost**	**Average Fixed Cost**
Increase	Decrease	Decrease

(D)

Average Total Cost	**Average Variable Cost**	**Average Fixed Cost**
Decrease	Increase	Increase

(E)

Average Total Cost	**Average Variable Cost**	**Average Fixed Cost**
Decrease	Decrease	Decrease

52. If a firm's production process exhibits economies of scale, which of the following will occur when the firm's output increases?

(A) Its short-run average total costs will rise.
(B) Its long-run average total costs will rise.
(C) Its long-run average total costs will fall.
(D) Its short-run average total costs will fall.
(E) Its long-run total costs will fall.

53. Which of the following is a result of increasing returns to scale?

h

(A) Upward-sloping short-run marginal cost curve
(B) Downward-sloping marginal physical product of labor curve
(C) Downward-sloping long-run average total cost curve
(D) Diseconomies of scale
(E) Diminishing returns

54. A farmer grows wheat using two inputs: labor and land whose prices are constant. If she doubles her inputs, she finds that the quantity of wheat produced more than doubles. Therefore, it must be true that in this output range her long-run average total cost curve is

(A) upward sloping
(B) downward sloping
(C) horizontal
(D) vertical
(E) U-shaped

55. Locotek produces toy trains and pays each worker $350 per week. Five workers can produce 40 trains per week and six workers can produce 45 trains per week. The marginal product per week of the sixth worker is

(A) $70
(B) $350
(C) 5 trains
(D) 7.5 trains
(E) 42.5 trains

56. Which of the following indicates that a firm is experiencing economies of scale?

(A) The firm’s long-run supply curve is horizontal.
(B) The firm’s long-run marginal cost increases as output increases.
(C) The firm’s long-run average total cost decreases as output increases.
(D) The firm’s long-run total cost decreases as output increases.
(E) The firm’s total revenues increase as output sold increases.

57. If a firm's long-run average total cost increases as output increases, the firm is experiencing

(A) economies of scale
(B) diseconomies of scale
(C) increasing returns to scale
(D) efficiency in plant size
(E) maximum economic profit

58. The long-run average cost curve will be sloping downward if a firm experiences

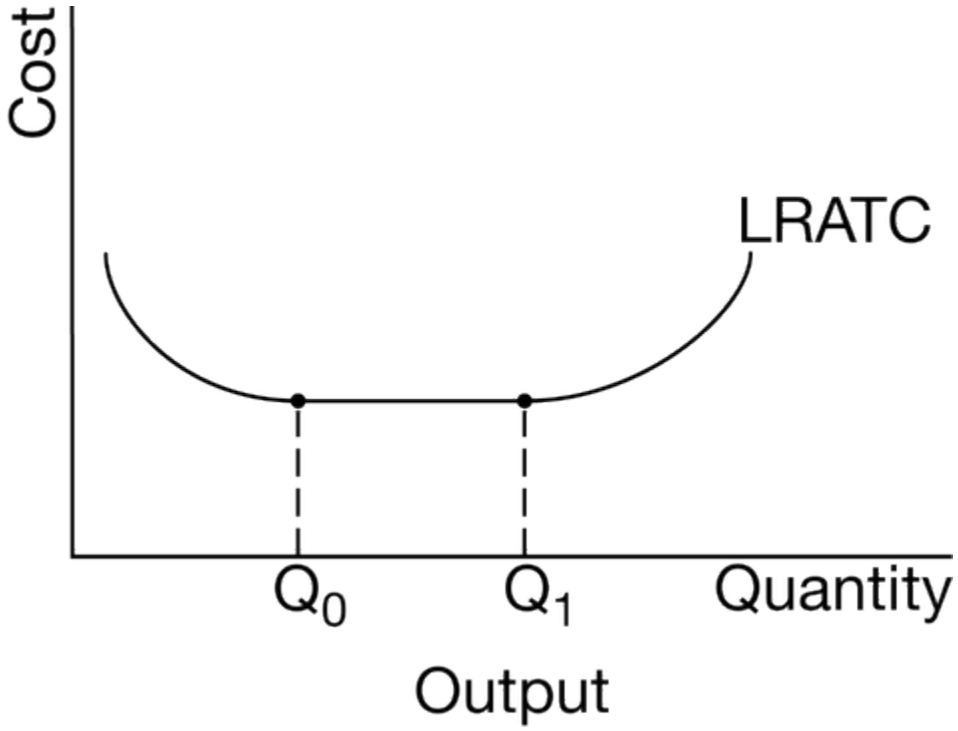
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(A) diminishing marginal returns
(B) decreasing returns to scale
(C) constant returns to scale
(D) diseconomies of scale
(E) economies of scale

59. Under which of the following circumstances is a firm experiencing economics of scale?

(A) The firm increases only its labor input, and output decreases.
(B) The firm doubles its inputs, and output triples.
(C) The firm builds a new plant, and the average cost of production increases.
(D) The firm hires a new plant manager, and profits increase.
(E) The product price increases, and the firm increases its output.

60.



The graph above shows a firm's long-run average total cost curve (LRATC). Which of the following statements is true as the firm increases its scale of production?

(A) From zero output to Q_0, the firm experiences diseconomies of scale.
(B) From Q_0 to Q_1, the firm experiences increasing returns to scale.
(C) For output levels above Q_1, the firm experiences diseconomies of scale.
(D) At all output levels, the firm's long-run marginal cost must be constant.
(E) From Q_0 to Q_1, LRATC falls because average fixed cost decreases; after Q_1, LRATC rises due to diminishing returns to labor.

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61. Assume that the short-run marginal cost curve initially falls, and it then rises as quantity of output increases. Which of the following must be true?

(A) The marginal product of labor is always falling.

(B) At every output level, the short-run marginal cost curve is always above the average variable cost curve.

(C) As output increases, the unit price of labor (the wage rate) is first falling and then rising.

(D) Initially the marginal product of labor increases but eventually marginal product of labor decreases.

(E) The average variable cost curve must always be rising.

62. Marginal cost is defined as the

(A) change in total cost resulting from producing an additional unit of output

(B) change in total cost resulting from using an additional unit of input

(C) difference between total cost and total variable cost

(D) difference between total variable cost and total fixed cost

(E) difference between average total cost and average variable cost divided by output

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The chart below gives a firm's total cost of producing different levels of output.

Output	Total Cost
0	$13
1	20
2	25
3	28
4	32
5	43
6	60

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63. The marginal cost of producing the fourth unit of output is

(A) $ 4
(B) $11
(C) $19
(D) $32
(E) impossible to determine from the information given

64. The total variable cost of producing five units of output is

(A) $ 6
(B) $11
(C) $30
(D) $43
(E) impossible to determine from the information given

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65. Assume that labor is the only variable input. If a firm's short-run marginal cost is increasing as output rises, which of the following must be true?

(A) Average product of labor is constant.
(B) Average product of labor is increasing.
(C) Marginal product of labor is greater than average product of labor.
(D) Marginal product of labor is decreasing.
(E) Total product of labor is decreasing.

66. The table below is partially filled in with the different types of costs for a firm. Based on the information in the table, what is the marginal cost of producing the second unit?

Quality	Variable Cost	Fixed Cost	Total Cost	Average Total Cost
0	$0	$60		
1			$130	
2				$90

(A) $50
(B) $60
(C) $70
(D) $90
(E) $180

67. If the average variable cost of producing 5 units of a good is $100 and the average variable cost of producing 6 units is $150, then the marginal cost of increasing output from 5 to 6 units is

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(A) $50
(B) $250
(C) $300
(D) $400
(E) $500

68. A firm's short-run production function uses capital and labor as inputs. Assume the quantity of capital is fixed in the short run. The marginal product of labor will decrease as more labor is used in the short run because each unit of labor will have

(A) zero units of capital to work with
(B) fewer units of capital to work with
(C) an increase in the capital-to-labor ratio
(D) more units of capital to work with
(E) an infinite number of units of capital to work with

69.

UNITS OF OUTPUT

Units of Labor \ Units of Capital	1	2	3
1	100	140	160
2	140	200	240
3	160	240	300

The table above shows the various units of output that can be produced with different combinations of capital and labor. Which of the following statements is correct according to the information in the table?

(A) In the long run, there are constant returns to scale.
(B) In the long run, there are increasing returns to scale.
(C) In the short run, the marginal product of capital is constant.
(D) In the short run, the marginal product of labor is constant.
(E) In the short run, the law of diminishing marginal returns does not hold.

70. Assume the marginal product of labor first rises, reaches a maximum, and then falls. If the average product of labor is falling, which of the following is true?

(A) The marginal product of labor is greater than the average product of labor.
(B) The level of output produced must be at its maximum.
(C) The marginal product of labor must be falling.
(D) The marginal product of labor must be negative.
(E) The average product of labor has not yet reached its maximum.

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The following two questions refer to the data in the table below.

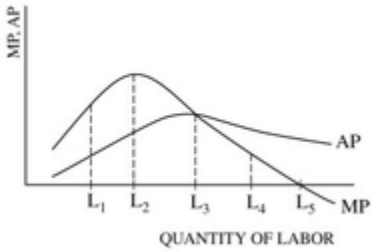
A perfectly competitive firm operates with a fixed amount of capital that costs $1,000 per day. Labor is the only variable input. The firm hires labor in a perfectly competitive labor market at $100 per day per worker. The table below shows the firm's production function.

Number of Workers Hired	Quantity of Output (units)
0	0
1	10
2	30
3	54
4	75
5	85
6	90

71. What is the marginal product of the third worker?

(A) 5
(B) 10
(C) 20
(D) 24
(E) It cannot be determined from the information given.

72.



The graph above shows the marginal product (MP) and the average product (AP) of labor for a firm that uses labor as the only variable input and hires its labor in a perfectly competitive market. At which quantity of labor does marginal cost change from decreasing to increasing?

h

(A) L_1
(B) L_2
(C) L_3
(D) L_4
(E) L_5

73. When the marginal cost curve lies below the average total cost curve, it is true that as output increases
(A) marginal cost is decreasing
(B) marginal cost is increasing
(C) average total cost is decreasing
(D) average total cost is increasing
(E) average variable cost is decreasing

74. Which of the following statements about cost is always true for both monopolies and perfectly competitive firms?
(A) Average total cost equals marginal cost when average total cost is a minimum.
(B) Marginal cost decreases as production increases.
(C) Average fixed cost is equal to marginal cost when average fixed cost is a minimum.
(D) Average variable cost is equal to marginal cost when marginal cost is a minimum.
(E) Average variable cost decreases as production increases.

75. Beyond a certain level of output, the short-run marginal cost will rise because
(A) there is no fixed input and costs will increase
(B) at least one input is fixed and eventually diminishing returns will occur
(C) the cost of the variable input increases when marginal product increases
(D) the demand for the good decreases when production is limited
(E) input prices increase when production increases and consumption is limited

76. A merger of two firms may increase economic efficiency by
(A) decreasing average total cost through an increase in economies of scale
(B) decreasing output to reduce marginal cost and equalize price
(C) increasing economic profits but decreasing consumer surplus
(D) increasing consumer surplus by decreasing economic profits
(E) increasing consumer surplus by shifting the demand curve for the product to the right

77. In the short run, a profit-maximizing firm, faced with U-shaped average cost curves, is producing a level of output at which the average total cost of production is minimized. At this level of output, which of the following is true for the firm?

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(A) Marginal cost equals average fixed cost.
(B) Marginal cost equals average variable cost.
(C) Marginal cost equals average total cost.
(D) Profit per unit equals average total cost.
(E) Profit per unit equals marginal cost.

78. If labor is the only variable input in the production process, the short-run marginal cost curve is upward sloping because which of the following occurs as more and more labor is added?

(A) Output decreases, and thus marginal cost increases.
(B) Output increases, and thus marginal cost increases.
(C) Output increases at an increasing rate, and thus the cost of producing each additional unit of output increases.
(D) Output increases at a decreasing rate, and thus the cost of producing each additional unit of output increases.
(E) Output increases at a decreasing rate, and thus the cost of producing each additional unit of output decreases.

79. Which of the following is true of the marginal cost curve?

(A) It intersects the average variable cost curve and the average total cost curve at each curve's minimum point.
(B) It intersects the average variable cost curve and the average fixed cost curve at each curve's minimum point.
(C) It lies between the total cost curve and the total variable cost curve.
(D) It increases initially, for a time, but begins to decline when the point of diminishing returns is reached.
(E) It decreases, because average variable cost is less than marginal cost.

80. In microeconomics, the short run is defined as which of the following?

(A) A period that is less than one year
(B) A period that is between one year and four years
(C) A period that is too short for a firm to be able to change its level of output
(D) A period during which some inputs in a firm's production process cannot be changed
(E) A period during which a firm's fixed costs exceed its variable costs

81. Which of the following best explains why a firm's short-run marginal cost curve shifts down when it purchases new, more efficient equipment and experiences an increase in its total cost?

(A) The situation represents an exception to the law of diminishing returns.
(B) The average total cost curve shifts upward as a result of the equipment purchase, and there is a movement up along the marginal cost curve.
(C) The equipment purchase is a fixed cost, and the new equipment will cause a reduction in the cost of producing each additional unit.
(D) The average variable cost curve shifts upward as a result of the equipment purchase, and the marginal cost curve shifts downward.
(E) The marginal cost curve shifts downward because of the law of diminishing returns.

82. In the short run, which of the following costs must continuously decrease as output produced increases?

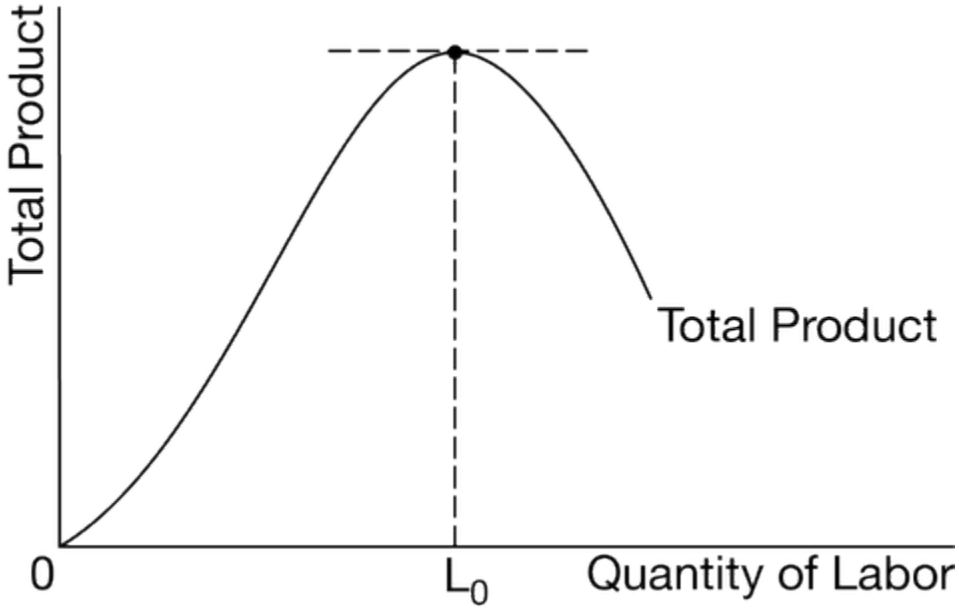
h

(A) Total variable cost
(B) Total fixed cost
(C) Average variable cost
(D) Average fixed cost
(E) Average total cost

83. In most cases the supply curve for a perfectly competitive industry can be described as which of the following?

(A) More elastic in the short run than in the long run
(B) More elastic in the long run than in the short run
(C) Downward sloping in the short run
(D) Perfectly inelastic in the long run
(E) Perfectly elastic in the short run

84.



Based on the short-run production function graph above showing the relationship between the quantity of labor and total product, which of the following statements is true?

(A) The marginal product of labor is always increasing.
(B) At L_0 the marginal product of labor is at its maximum.
(C) Total product is maximized when marginal product is zero.
(D) At L_0 the marginal product of labor exceeds the average product of labor.
(E) The marginal product of labor is always positive.

h

The following questions refer to the diagram below, which shows the short-run production function of a perfectly competitive firm that produces potatoes using one variable input, labor.

Number of Workers	Potatoes Harvested (pounds per hour)
0	0
1	3
2	7
3	10
4	12
5	13
6	12

85. After which worker does diminishing marginal product first occur?

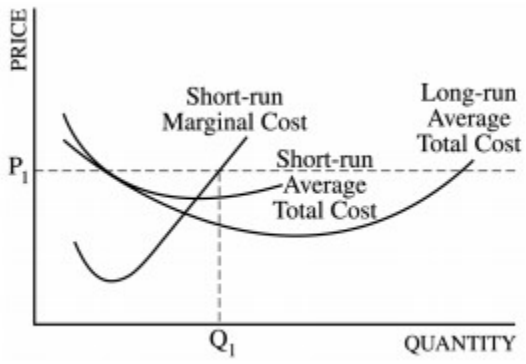
(A) Second worker
(B) Third worker
(C) Fourth worker
(D) Fifth worker
(E) Sixth worker

86. As its output increases, a firm's short-run marginal cost will eventually increase because of

(A) diseconomies of scale
(B) a lower product price
(C) inefficient production
(D) the firm's need to break even
(E) diminishing returns

h

The following questions refer to the graph below, which shows the cost curves of a firm.



87. If the firm produces Q_1 units of output with two inputs, the firm will be experiencing which of the following in the short run and in the long run?

h

(A)

Short Run	Long Run
Increasing marginal returns	Economies of scale

(B)

Short Run	Long Run
Increasing marginal returns	Diseconomies of scale

(C)

Short Run	Long Run
Diminishing marginal returns	Economies of scale

(D)

Short Run	Long Run
Diminishing marginal returns	Diseconomies of scale

(E)

Short Run	Long Run
Constant marginal returns	Diseconomies of scale

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88. Which of the following best describes the relationship between the average total cost curve and the marginal cost curve in the short run?

(A) If the average total cost curve is rising, the marginal cost curve is above the average total cost curve.
(B) If the average total cost curve is rising, the marginal cost curve is below the average total cost curve.
(C) If the average total cost curve is above the marginal cost curve, the marginal cost curve is rising.
(D) If the average total cost curve is below the marginal cost curve, the marginal cost curve is falling.
(E) If the average and marginal cost curves intersect, the marginal cost curve is at a minimum.

89. Which of the following statements about short-run costs is true?

h

(A) Average fixed cost plus variable cost equals total cost.

(B) Average total cost plus average fixed cost equals average variable cost.

(C) Total fixed cost increases in constant increments as output produced increases.

(D) Total fixed cost plus total variable cost equals total cost.

(E) At low output levels, as output increases, total fixed cost and total variable cost decrease, reducing average total cost.

90. Assume a firm doubles its usage of each input, resulting in a doubling of the firm's output. Which of the following describes this result?

(A) Increasing total cost

(B) Diminishing marginal returns

(C) Decreasing returns to scale

(D) Constant returns to scale

(E) Increasing returns to scale

91.

Number of Workers	Number of Units of Capital	Total Product (Quantity)
0	5	0
1	5	1
2	5	3
3	5	7
4	5	10
5	5	12

Suppose labor and capital can be hired in a competitive market. The wage is $\$15$ per worker and the rental rate of capital is $\$10$ per unit. Based on the table, what are the average variable cost (AVC) and average total cost (ATC) of producing 10 units of output?

(A) AVC is $\$5$ and ATC is $\$12$

(B) AVC is $\$6$ and ATC is $\$11$

(C) AVC is $\$15$ and ATC is $\$25$

(D) AVC is $\$60$ and ATC is $\$110$

(E) AVC is $\$105$ and ATC is $\$175$

92. Which of the following explains the difference between short-run and long-run costs?

h

(A) All costs are variable in the short run but not in the long run.
(B) All costs are fixed in the long run but not in the short run.
(C) All costs are variable in the long run but not in the short run.
(D) All costs are fixed in the short run but not in the long run.
(E) All costs are variable in the short run and fixed in the long run.

93. If a new tax on capital increases a firm's fixed cost of production, which of the following will occur in the short run?

(A) Marginal cost will increase.
(B) Average variable cost will increase.
(C) Average total cost will increase.
(D) The profit-maximizing level of output will increase.
(E) The profit-maximizing level of output will decrease.

94. A short-run production function shows the relationship between a firm's inputs and the output it produces when the firm

(A) does not vary any of its inputs
(B) has at least one fixed input
(C) varies all of its inputs
(D) has constant marginal cost
(E) has no fixed costs

95. When total physical product is at its maximum, marginal physical product must be

(A) greater than one
(B) equal to one
(C) equal to zero
(D) less than zero
(E) constant

96. If the price of a firm's variable input increases, which of the following will occur?

(A) The firm will decrease its level of production.
(B) The price of the good will decrease in the short run.
(C) The firm's marginal costs will decrease at every level of output.
(D) The firm's average fixed cost will decrease.
(E) More firms will enter the industry in the long run.

97. If a single firm can produce and supply an entire market at a lower unit cost than many small firms can, the long-run average total cost must be

h

(A) increasing as firm size increases
(B) remaining constant as firm size increases
(C) decreasing as the firm's output increases
(D) inelastic due to specialization
(E) constant and equal to marginal cost

98. An increase in which of the following will cause a firm's marginal cost curve to shift upward?

(A) The price of a variable input
(B) The price of a fixed input
(C) The level of output
(D) Labor productivity
(E) The demand for the firm's product

99. When marginal product exceeds average product, which of the following must be true?

(A) Average product is increasing.
(B) Average product is decreasing.
(C) Marginal product is increasing.
(D) Total product is decreasing.
(E) Total product is at its maximum.

100. Which of the following best explains why the short-run average total cost curve is U-shaped?

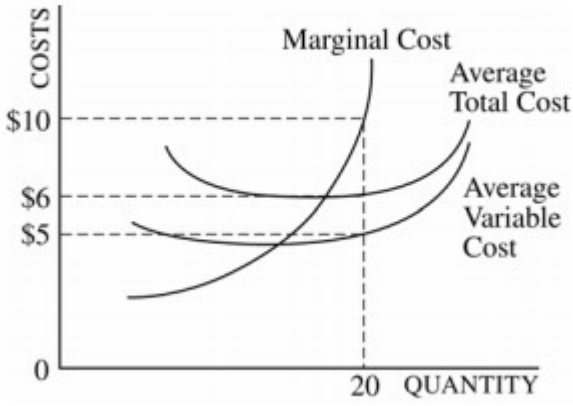
(A) Spreading total fixed costs over a larger output, and constant returns
(B) Spreading total fixed costs over a larger output, and eventually diminishing returns
(C) Increasing total fixed costs and increasing returns
(D) Increasing average variable costs and decreasing returns
(E) Decreasing average variable costs and increasing returns

101. Technological advances will lead to

(A) an increase in marginal utility
(B) a decrease in average total costs
(C) a decrease in net exports
(D) an increase in marginal costs
(E) diseconomies of scale

h

102.



The graph above shows the cost curves for a competitive firm that produces 20 units of output. What are the total cost and the total fixed cost of producing 20 units of output?

h

(A)

Total Cost	Total Fixed Cost
$10	$0

(B)

Total Cost	Total Fixed Cost
$120	100

(C)

Total Cost	Total Fixed Cost
$120	$20

(D)

Total Cost	Total Fixed Cost
$200	$100

(E)

Total Cost	Total Fixed Cost
$200	$20

103.

Number of Workers	Quantity of Output
0	0
1	10
2	25
3	35
4	40
5	42

Given the production schedule above, what is the maximum number of workers the firm can hire before the effects of diminishing marginal returns set in?

h

(A) 1
(B) 2
(C) 3
(D) 4
(E) 5