Unit 5.3 Profit-Maximizing Behavior in Perfectly Competitive Factor Markets

AP Microeconomics Homework

Question Bank

1. Question Bank Q8

A firm uses capital and labor in its production process. The marginal product for the last unit of labor is 5, the marginal product for the last unit of capital is 10, and the wage is $10. At what cost of hiring each unit of capital would the firm be minimizing the cost of the current output?

(A) $5

(B) $10

(C) $15

(D) $20

(E) $50

2. Question Bank Q9

For a certain firm, the marginal revenue product for the last unit of labor is $60, and the marginal revenue product for the last unit of capital is $100. Which of the following combinations of factor prices would be necessary for the firm to maximize profits?

	Price of Labor	Price of Capital
(A)	$2	$5
(B)	$3	$20
(C)	$10	$10
(D)	$2	$25
(E)	$60	$100

3. Question Bank Q10

A profit-maximizing firm hires labor in a perfectly competitive market. Labor is the only variable input, and the marginal product of the last worker hired is 10 units per hour. If the hourly wage is $20, the firm's marginal revenue

(A) is $2

(B) is $20

(C) increases as more output is produced

(D) increases first and then decreases as more output is produced

(E) decreases first and then increases as more output is produced

4. Question Bank Q11

A firm sells its output in a perfectly competitive market and hires two inputs, capital and labor, in perfectly competitive factor markets. The product price is $15 per unit, the wage is $75 per day, and the marginal product of capital is 3. If the firm is choosing the least-cost combination of labor and capital, the firm's marginal product of labor and the price of capital must be equal to which of the following?

	Marginal Product of Labor	Price of Capital
(A)	25	$5
(B)	25	$45
(C)	5	$15
(D)	5	$25
(E)	5	$45

5. Question Bank Q12

Number of Workers	Total Product
1	15
2	20
3	24
4	27
5	29

The table above shows the short-run output for a perfectly competitive firm. If the price of the product is $10, what is the marginal revenue product of the third worker hired?

(A) $24

(B) $27

(C) $40

(D) $240

(E) $300

6. Question Bank Q14

Output Quantity (units)	Total Revenue ($)
0	0
1	11
2	20
3	27
4	32
5	35
6	36
7	35

The marginal product of labor is constant at 1 unit for every additional unit of labor. The monopolist hires labor in a perfectly competitive market at the wage rate of $5 per hour. How many units of labor should the firm employ to maximize profits?

(A) 1

(B) 2

(C) 4

(D) 5

(E) 6

7. Question Bank Q15

A perfectly competitive firm is currently producing at the profit-maximizing output level. If the marginal physical product of labor is 10 units per hour and the firm pays a wage rate of $8 per hour, which of the following is true?

(A) The marginal revenue product of labor is $80.

(B) The marginal cost is $1.25.

(C) The average total cost is $0.80 per unit.

(D) The output price is $0.80 per unit.

(E) The output price is $1.25 per unit.

8. Question Bank Q16

A firm is currently employing a cost-minimizing combination of labor and capital for a given level of output. The firm is employing 20 workers, and the marginal product of the last worker is 40 units of

output. The firm is employing 100 units of capital, and the marginal product of the last unit of capital is 10 units of output. If the wage rate is $20 per hour, what is the price of capital?

(A) $2.5 per hour

(B) $5 per hour

(C) $10 per hour

(D) $100 per hour

(E) $200 per hour

9. Question Bank Q22

A contractor is employing labor and capital to build an office complex. At the current mix of inputs, the marginal product of labor is 30 square feet per day, and the marginal product of capital is 90 square feet per day. The price of labor is $1,000 per day, and the price of capital is $3,000 per day. To hire inputs in a cost-minimizing way, the firm should

(A) hire more labor and less capital

(B) hire less labor and more capital

(C) hire more labor and more capital

(D) hire less labor and less capital

(E) make no changes to the mix of inputs

10. Question Bank Q23

Firm Z is producing 50 widgets using labor and capital. The marginal product of the last unit of labor employed is 500; the marginal product of the last unit of machinery (or capital) is 1000. The unit price of labor is $10, and the unit price of machinery or capital is $100. With competitive input markets, which of the following statements is true?

(A) The firm is minimizing the cost of producing 50 widgets with this combination of labor and capital.

(B) The marginal product of labor is 500 and the marginal product of capital is 1000, so the firm is employing too much labor and too few machines to produce the 50 widgets.

(C) The marginal product per dollar of labor exceeds the marginal product per dollar of machinery, so more labor and less capital should be used to produce the 50 widgets.

(D) The firm should lower the price of machinery so that it is equal to the price of labor.

(E) The firm is producing the given quantity inefficiently and should shut down.

11. Question Bank Q24

In the long run, assume a firm uses both labor and capital to produce 25 units of output. The marginal product of the last unit of labor being employed is 100; the marginal product of the last unit of capital being employed is 500. The wage rate of labor is $10. If the firm is minimizing the cost of producing 25 units of output, what must be the unit price of capital?

(A) $5

(B) $10

(C) $25

(D) $50

(E) $500

12. Question Bank Q25

Mary manages a manufacturing plant. Two inputs are used to produce the product. To minimize the costs of production, Mary should continue to hire inputs up to the level at which the

(A) price of each input is equal

(B) marginal product of each input is equal

(C) (marginal product × price) of each input is equal

(D) (marginal product / price) of each input is equal

(E) (marginal product − price) of each input is equal

13. Question Bank Q26

Pickleco, a pickle-producing firm, hires labor and capital in perfectly competitive factor markets. The firm is minimizing its costs at the current production level. The marginal product of labor is 100 units and the marginal product of capital is 60 units. If the rental price of capital is $12, what is the wage Pickleco is paying its workers?

(A) $5.00

(B) $8.33

(C) $12.00

(D) $20.00

(E) $40.00

14. Question Bank Q27

Assume that labor and capital are the only two inputs a perfectly competitive firm uses to produce wheat. The firm hires its inputs in perfectly competitive input markets. The unit price of labor is $8 and of capital is $20. When the firm employs the profit-maximizing combination of these two inputs, the marginal product of labor is 2 tons of wheat and of capital is 5 tons of wheat. The price of wheat per ton must be

(A) $2

(B) $4

(C) $5

(D) $8

(E) $10

15. Question Bank Q30

ABC Limited, Inc., sells its product in a perfectly competitive market for a price of $15 per unit and hires workers at a daily wage of $75. Labor is the only factor cost, and the firm is currently earning profits. If ABC hires one more worker and output increases by 5 units per day, the firm's profits will

(A) decrease by $5

(B) decrease by $75

(C) increase by $75

(D) increase by $15

(E) remain unchanged

16. Question Bank Q31

At a given quantity of output of a firm, if the marginal product of capital equals the marginal product of labor and the wage rate equals the rental rate of capital, then

(A) the firm is producing that quantity at the lowest cost

(B) the firm should use more capital and less labor to minimize cost

(C) the firm should use less capital and more labor to minimize cost

(D) the firm should use more of both inputs to increase quantity

(E) the firm should use less of both inputs to increase quantity

17. Question Bank Q43

The last worker currently employed by a firm has a marginal product of 3 units per hour and is paid $20 per hour. Assuming that both the labor market and product market are perfectly competitive and that the product's price is $5 per unit, the firm should do which of the following?

(A) Decrease wages

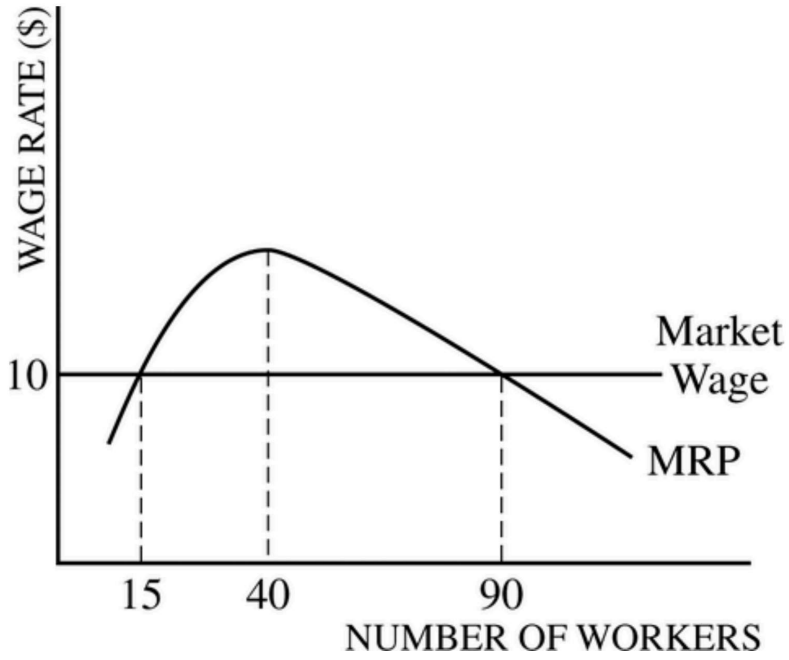
(B) Increase wages

(C) Employ more workers

(D) Employ fewer workers

(E) Increase the product's price

18. Question Bank Q44



The graph above shows the marginal revenue product (MRP) and the market wage rate for a profit-maximizing firm. Which of the following is true of the firm's hiring of labor?

(A) It should hire 15 workers.

(B) It should hire between 15 and 40 workers.

(C) It should hire 40 workers.

(D) It should hire between 40 and 90 workers.

(E) It should hire 90 workers.

19. Question Bank Q45

A perfectly competitive firm currently produces 1,000 units of output and hires its resources in a perfectly competitive factor market. It uses both labor and capital as inputs. The price of labor is $40; the price of capital is $100. The marginal product of labor is 8 units, and the marginal product of capital is 10 units. Which of the following must be true?

(A) The firm is currently maximizing its profit.

(B) The firm can produce more than 1,000 units without increasing the total cost if it uses more labor and less capital.

(C) The firm can produce more than 1,000 units without increasing the total cost if it uses more capital and less labor.

(D) The firm can reduce the cost of producing 1,000 units by using less capital and employing the same amount of labor.

(E) The firm can reduce the cost of producing 1,000 units by employing less labor and using the same amount of capital.

20. Question Bank Q48

Let W denote nominal wage, P the output price, and MP_L the marginal product of labor. Which of the following relationships correctly estimates the marginal cost (MC) of production for a perfectly competitive firm in the short run?

(A) $MC = P / MP_L$

(B) $MC = P \times MP_L$

(C) $MC = W \times MP_L$

(D) $MC = W / MP_L$

(E) $MC = MP_L / W$

21. Question Bank Q50

Quantity of Labor	Marginal Product	Marginal Revenue Product
0	—	—
1	20	$40
2	14	$28
3	12	$24
4	8	$16
5	6	$12
6	4	$8

Based on the table for a perfectly competitive firm above, if the wage rate for labor is $15, how many units of labor should the firm hire?

(A) 2

(B) 3

(C) 4

(D) 5

(E) 6

22. Question Bank Q51

Number of Workers	Output
1	3
2	9

3	16
4	21
5	23
6	24

The table above shows how much daily output a firm can produce using different numbers of workers. The firm is perfectly competitive in both the labor and product markets. If output sells for $20 per unit and the daily wage is $100 per worker, how many workers should the firm hire to maximize profit?

(A) 1

(B) 2

(C) 4

(D) 5

(E) 6

23. Question Bank Q52

Refer to the table for Q51 above. If output sells for $20 per unit, what is the marginal revenue product of the fifth worker?

(A) $2

(B) $40

(C) $100

(D) $115

(E) $460

24. Question Bank Q53

Number of Workers	Parts per Week
0	0
1	100
2	190
3	270
4	340
5	400
6	450

7	480

The table above describes the production function of an auto parts manufacturer. Assume that the firm can hire as many workers as it wants at the market wage rate of $600 per week per worker and sell as many auto parts as it wants at the price of $10 per part. To maximize profits, the firm should hire

(A) 0 workers

(B) 1 worker

(C) 3 workers

(D) 5 workers

(E) 7 workers

25. Question Bank Q54

A perfectly competitive profit-maximizing firm will continue to hire additional units of an input as long as the

(A) marginal product of the input is maximized

(B) marginal cost of employing the input is maximized

(C) value of the marginal product of the input exceeds the price of the input

(D) revenue associated with the employment of the last unit of the input is maximized

(E) price of the product is greater than the marginal cost of the input

26. Question Bank Q55

Assume that a profit-maximizing, perfectly competitive firm hires labor in a perfectly competitive labor market. If the market wage is $12 per hour and the price of the product is $3 per unit, the firm will

(A) hire more workers if each worker can produce 3 units per hour

(B) hire another worker if the output per hour of the additional worker exceeds 4 units

(C) hire fewer workers, since the hourly wage exceeds the cost of producing one unit of output

(D) not hire any workers, since the cost of labor is greater than the price of the output

(E) continue to operate in the short run but not in the long run

27. Question Bank Q58

A profit-maximizing firm should hire an input up to the point at which

(A) marginal physical product equals marginal revenue product

(B) marginal revenue equals marginal factor cost

(C) marginal revenue product equals marginal revenue

(D) marginal revenue product equals marginal factor cost

(E) marginal physical product equals marginal factor cost

28. Question Bank Q59

Given the following information:

- The marginal product of labor equals 250 units of output.
- The marginal product of capital equals 750 units of output.
- The price of labor is $50 per person.
- The price of capital is $100 per unit.

Which of the following is true for a firm buying its labor and capital inputs in a perfectly competitive market?

(A) The firm is producing its current level of output with the least-cost combination of labor and capital.

(B) The firm is maximizing profits with its current combination of inputs.

(C) The firm's level of output will remain the same if 1 unit of capital is substituted for 2 units of labor.

(D) The firm's input costs will decrease if 2 units of labor are substituted for 1 unit of capital.

(E) The firm can reduce the cost of its current level of output by laying off workers and employing more capital.

29. Question Bank Q61

Number of Workers	Total Output of Coal (tons per day)
0	0
1	25
2	44
3	60
4	70
5	75

The table above shows the relationship between the number of workers and coal output. How many workers would the coal company want to hire if the price of coal were competitively priced at $5 per ton and the wage rate were $40 per day?

(A) 5

(B) 4

(C) 3

(D) 2

(E) 0

30. Question Bank Q63

At its current employment level of labor and capital, a firm observes the following.

- Marginal product of labor = 30 units
- Marginal product of capital = 60 units
- Price of labor = $3 per unit
- Price of capital = $15 per unit

Which of the following actions should the firm take in order to achieve the least-cost combination of labor and capital and produce the same level of output?

	Labor	Capital
(A)	Increase	Increase
(B)	Increase	Decrease
(C)	Decrease	Increase
(D)	Decrease	Decrease
(E)	No change	No change

31. Question Bank Q66

A profit-maximizing firm will continue to hire workers until the marginal revenue product of labor is equal to the

(A) marginal product of labor

(B) marginal revenue product of capital

(C) demand for labor

(D) price of the good that labor is producing

(E) marginal factor cost

32. Question Bank Q69

A firm produces truffles by using labor and capital. The price of labor is $10 per unit, and the price of capital is $20 per unit. At current output level, the marginal product of labor is 40 truffles and the marginal product of capital is 60 truffles. To reduce the total cost of producing the current quantity of truffles, how should the firm change its spending on labor and capital?

	Labor	Capital
(A)	No change	Increase
(B)	Decrease	No change
(C)	Decrease	Increase

(D)	Increase	No change
(E)	Increase	Decrease

33. Question Bank Q72

The wage rate is $10 per hour and the last worker hired by the firm increased output by 100 units. Computers rent for $100 per hour and the last computer rented by the firm increased output by 2,000 units. To minimize costs the firm should

(A) hire more workers and rent more computers because the marginal revenue products of both workers and computers are greater than their respective prices.

(B) hire more workers and reduce the number of computers rented because workers are cheaper than computers

(C) lay off workers and rent more computers because computers produce more output per dollar of additional expenditure

(D) lay off workers and rent more computers because computers produce more output

(E) keep the same number of workers and computers because the marginal revenue products of both workers and computers are positive

34. Question Bank Q73

Assume a firm uses only two inputs, capital (K) and labor (L), to produce its output. Let the marginal product of capital be MP_K, the marginal product of labor be MP_L, the price of capital be P_K, and the price of labor be P_L. The least-cost combination of capital and labor needed to produce a given level of output is given by which of the following?

(A) $MP_L / P_L = MP_K / P_K$

(B) $MP_L / P_L > MP_K / P_K$

(C) $MP_L / P_K = MP_K / P_L$

(D) $(MP_L)(P_L) = (MP_K)(P_K)$

(E) $MP_L = MP_K$

35. Question Bank Q74

If a firm employs only labor and capital in its production process, which of the following best describes the optimal combination of inputs for the firm in the long run?

(A) The marginal product per dollar spent on labor is equal to the marginal product per dollar spent on capital.

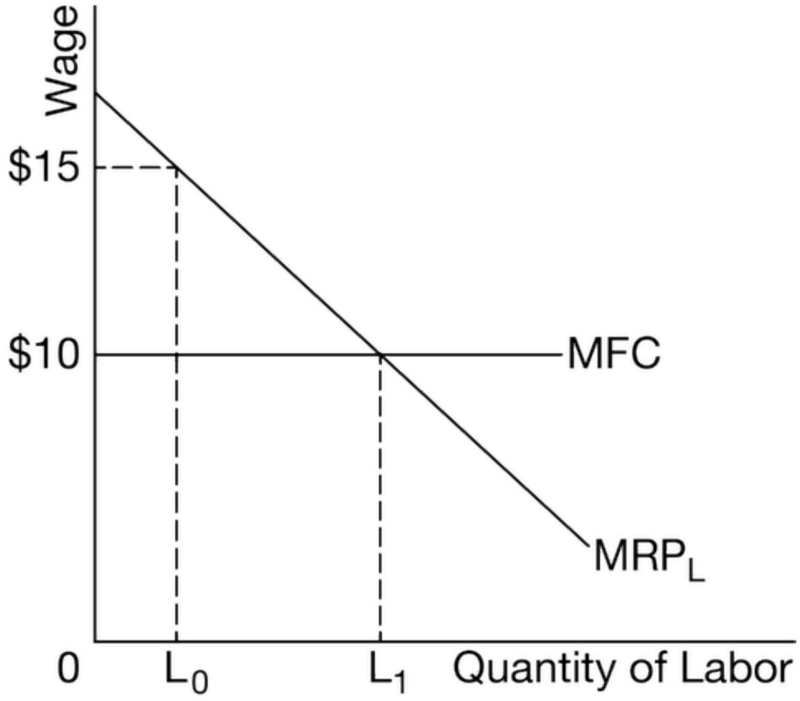
(B) The marginal product of labor is equal to the marginal product of capital.

(C) The total product of labor is equal to the total product of capital.

(D) The marginal product of labor and capital are both zero.

(E) All marginal products are equal to all average products.

36. Question Bank Q75



Based on the graph above, which of the following statements is true?

(A) Hiring unit of labor L_0 will add $15 to a firm's economic profits.

(B) The market wage rate is $10 per unit of labor.

(C) The profit-maximizing firm will hire its labor at less than $10 per unit.

(D) From 0 units of labor to L_0 units of labor, there are increasing marginal returns to labor.

(E) Along the firm's marginal revenue product of labor curve, the price of output falls as more labor is hired and more output is produced.

37. Question Bank Q78

Assume that a firm uses labor and capital to produce a product. The firm hires labor at a wage rate of $4 per unit and rents capital at $5 per unit. At its current output level, the marginal physical products of labor and capital are 20 and 30 units, respectively. To minimize its cost of production without changing the level of output, the firm should

(A) make no changes

(B) hire more labor and rent more capital

(C) hire less labor and rent more capital

(D) hire more labor and rent less capital

(E) hire less labor and rent less capital

38. Question Bank Q79

Assume that the last worker a firm hired produces 60 additional units of output per hour and the last machine rented produces 6,000 units of output per hour. A worker's hourly wage rate is $12, and the rental cost of a machine is $1,000 per hour. In order to minimize the cost of its current output, the firm should

(A) do nothing, because the costs of production are minimized

(B) increase the use of labor and decrease the use of capital

(C) increase the use of capital and decrease the use of labor

(D) increase the use of labor and increase the use of capital

(E) decrease the use of labor and decrease the use of capital

39. Question Bank Q92

Max employs both labor and capital to produce toy trains. Currently the last unit of labor employed has a marginal product of 15 units. The last unit of capital employed has a marginal product of 40 units. The price of labor is $3 per unit, and the price of capital is $10 per unit. Which of the following employment decisions should Max follow to use the least-cost combination of labor and capital to produce the current quantity of toy trains?

	Employment of Labor	**Employment of Capital**
(A)	Increase	No change
(B)	Decrease	Increase
(C)	Decrease	Decrease
(D)	Increase	Increase
(E)	Increase	Decrease

40. Question Bank Q93

If labor is the only variable input of a firm and the marginal product of labor is falling, the firm will always produce

(A) more than the profit-maximizing level of output

(B) less than the profit-maximizing level of output

(C) at a level of output where average total cost is at a minimum

(D) at a level of output where marginal costs are rising

(E) at a level of output where average variable costs are falling

41. Question Bank Q94

If a competitive firm pays its workers the value of the marginal product of the last worker hired, which of the following is true?

(A) The firm will not earn any economic profits.

(B) Workers will look for employment elsewhere.

(C) The wage will be less than the marginal product.

(D) The firm will not maximize profits.

(E) The contribution of the last worker hired to the firm's profit will be zero.

42. Question Bank Q95

Assume that a firm is hiring labor in a perfectly competitive labor market. If the marginal revenue product of labor is greater than the wage rate, which of the following will be true?

(A) The firm must be losing money.

(B) The firm should employ more workers.

(C) The firm should replace workers with capital.

(D) The firm is maximizing its profits.

(E) The firm is experiencing diminishing marginal utility.

43. Question Bank Q98

Which of the following indicates that a perfectly competitive firm has hired the profit-maximizing amount of labor?

(A) The total product of labor exceeds the total real wage payments to workers.

(B) The average product of labor exceeds the real wage paid to workers.

(C) The marginal revenue product of labor is below the wage paid to workers.

(D) The marginal revenue product of labor is above the wage paid to workers.

(E) The marginal revenue product of labor equals the wage paid to workers.

44. Question Bank Q100

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

5	13
6	12

The table above shows the short-run production function of a perfectly competitive firm that produces potatoes using one variable input, labor. If the firm can sell as many potatoes as it wants for $2 per pound and has to pay each worker $5 per hour, how many workers should the firm employ to maximize profits?

(A) 1

(B) 2

(C) 3

(D) 4

(E) 5

45. Question Bank Q104

A profit-maximizing firm will continue to hire workers until the

(A) marginal factor cost of labor is equal to the marginal revenue product of labor

(B) marginal factor cost of labor is equal to the price of the good produced using labor

(C) marginal product of labor is equal to the marginal revenue product of labor

(D) marginal product of labor is equal to the marginal factor cost of labor

(E) marginal product of labor is equal to the price of labor

46. Question Bank Q107

A profit-maximizing firm will hire

(A) labor until its wage rate equals its average revenue product

(B) labor until its wage rate equals its marginal revenue product

(C) labor until its wage rate equals the interest rate

(D) capital until the interest rate equals the wage rate

(E) capital until the interest rate exceeds the wage rate

Past Exam Questions

47. 2022 AP Micro MCQ Q9

Assume that capital and labor are the only two inputs used by a clinic. The table shows the hourly marginal product and the hourly price of capital and labor at the current output level.

	Capital	**Labor**
Marginal Product	25 units	5 units

Price	$200	$50

To minimize costs at the current output level, the clinic should change the hiring of capital and labor in which of the following ways?

	Capital	Labor
(A)	Increase	Decrease
(B)	Decrease	Increase
(C)	Increase	Increase
(D)	Decrease	Decrease
(E)	No change	No change

48. 2023 AP Micro MCQ Q55

The table provided shows the daily output for a profit-maximizing T-shirt firm that is operating in a perfectly competitive product market and hires labor from a perfectly competitive labor market. If each T-shirt sells for $10 and the equilibrium daily wage is $100, how many workers will the firm hire to maximize profit?

Number of Workers	T-Shirts Produced per Day
0	0
1	24
2	44
3	60
4	72
5	80

(A) 1

(B) 2

(C) 3

(D) 4

(E) 5

49. 2023 AP Micro MCQ Q60

ZBA is a typical profit-maximizing firm in a perfectly competitive market that produces and sells widgets at $5 each. ZBA hires labor in a perfectly competitive labor market. The table shows ZBA's production

function for widgets.

Number of Workers	Total Output of Widgets
0	0
1	24
2	44
3	60
4	72
5	80

If the hourly wage is $9, how many workers will the firm hire to maximize profit?

(A) 1

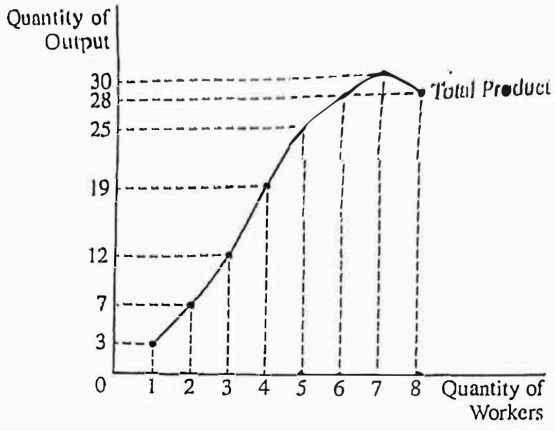
(B) 2

(C) 3

(D) 4

(E) 5

50. 2024 AP Micro MCQ Q21



Carnival Funnel Cakes sells its funnel cakes for $4 in a perfectly competitive market and hires workers from a perfectly competitive labor market at a wage of $10. The graph provided shows the total product curve for funnel cakes. Assuming labor is the only variable input, what is the profit-maximizing number of workers that Carnival Funnel Cakes will hire?

(A) 3 workers

(B) 4 workers

(C) 5 workers

(D) 6 workers

(E) 7 workers

51. 2024 AP Micro MCQ Q53

A firm hiring labor from a perfectly competitive labor market will have hired more than the profit-maximizing quantity of labor when the

(A) marginal revenue product of labor is greater than the marginal factor cost of labor

(B) marginal revenue product of labor is less than the marginal factor cost of labor

(C) marginal revenue product of labor is equal to the marginal factor cost of labor

(D) total revenue is greater than total cost

(E) total revenue is equal to total cost

52. 2024 AP Micro MCQ Q56

Yann's Waffles can hire all the workers it wants at $20 per hour. Yann's Waffles sells its waffles at $10 each. Assuming that labor is the only variable input, Yann's Waffles will maximize its profits when

(A) the marginal product of the last worker hired is 2 waffles per hour

(B) the marginal revenue product of the last worker hired is $200

(C) the marginal factor cost of the last worker hired is $200

(D) total product is 200 waffles per hour

(E) total revenue is $200

53. 2025 AP Micro MCQ Q47

Avocado production requires land to grow avocado trees and workers to pick the avocados. Which of the following is most likely to occur if a binding minimum wage (a price floor on wages) is set in the labor market of avocado-farming workers?

(A) The supply of avocados will decrease.

(B) The demand for avocados will decrease.

(C) There will be a surplus of avocados.

(D) Farms will hire more workers.

(E) The price of land will increase.

FRQ — Past Exam Questions

54. 2021 AP Micro FRQ Q2(a)-(c)

Schmitt Inc. provides car parking services in a perfectly competitive output market and hires labor in a perfectly competitive input market. The market price per car parked is $10, the daily market wage per worker is $100, and fixed costs are $50 per day. The table shows the number of workers required to park different quantities of cars per day.

Number of Workers	Number of Cars Parked per Day
0	0
1	12
2	22
3	30
4	36
5	40

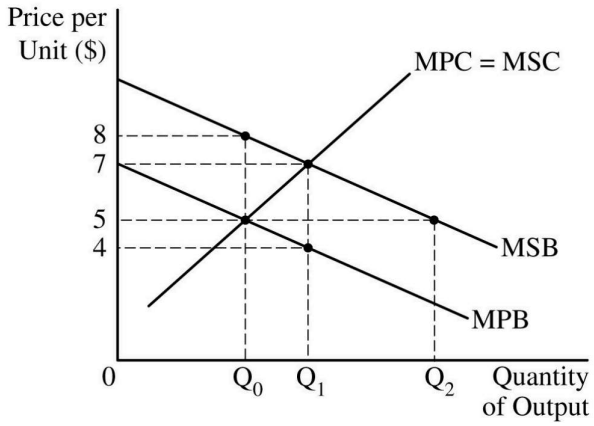
(a) Calculate the marginal revenue product of the second worker. Show your work.

(b) How many workers will Schmitt Inc. hire to maximize profit? Relative to this number of hired workers, explain why Schmitt Inc. will not hire one additional worker. Your answer must use marginal analysis and numbers from the table.

(c) Calculate the daily profit for Schmitt Inc. at the profit-maximizing quantity identified in part (b). Show your work.

55. 2022 AP Micro FRQ Q2(c)

Bueno is a firm that produces and sells guava, a type of fruit. The market for guava is perfectly competitive. The marginal private benefit (MPB), marginal private cost (MPC), marginal social benefit (MSB), and marginal social cost (MSC) curves are illustrated in the graph provided.



Assume the guava market is in short-run equilibrium and Bueno hires workers in a perfectly competitive labor market at a wage of $20 per hour. The marginal product of the last worker hired was 6 units of

guava per hour.

(i) Calculate the change in Bueno's profit per hour from the last worker hired. Show your work.

(ii) Suppose that the government decides to provide a per-unit subsidy to consumers who buy guava. How would the per-unit subsidy affect Bueno's marginal revenue product curve? Explain.

56. 2023 AP Micro FRQ Q1(d)

RKB is a profit-maximizing monopoly that produces a new, patented electronic device. Assume that RKB hires workers in a perfectly competitive labor market.

(i) Draw a correctly labeled graph for the labor market, showing the equilibrium wage and quantity of labor, labeled W_E and Q_E, respectively.

(iii) RKB uses the optimal combination of capital and labor in its production process. The firm rents capital at $500 per unit, and the last unit of capital rented has a marginal product of 2,500 units. If the marginal product of the last unit of labor hired is 1,000 units, calculate the wage rate. Show your work.