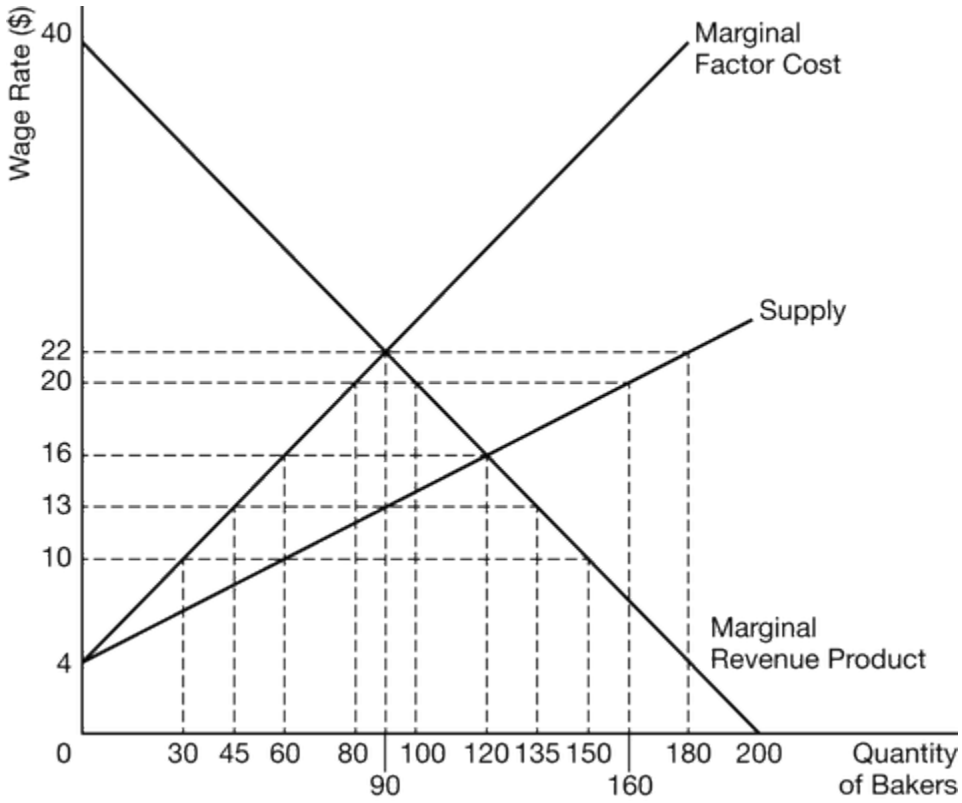
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Include correctly labeled diagrams, if useful or required, in explaining your answers. A correctly labeled diagram must have all axes and curves clearly labeled and must show directional changes. If the question prompts you to "Calculate," you must show how you arrived at your final answer.

Bobby's Bakehouse is the only bakery in a small remote town, and Bobby's Bakehouse is the only employer of bakers in the area. The graph below shows the market for bakers with the marginal factor (resource) cost curve, the labor supply curve, and the marginal revenue product curve.



(a) If the wage rate is $13, state whether there will be a shortage or a surplus of bakers and calculate its size. Show your work.

(b) Identify the profit-maximizing number of bakers that Bobby's Bakehouse will hire. Explain using the labeling on the graph.

(c) Identify the profit-maximizing wage rate that Bobby's Bakehouse will pay its bakers. Explain using the labeling on the graph.

(d) If the marginal product of bakers increases, what will happen to the quantity of output produced by Bobby's Bakehouse? Explain.

(e) Assume instead that Bobby's Bakehouse uses both labor and capital in its production of baked goods. The marginal product of the last unit of labor hired is 16 baked goods per hour and the marginal product of the last unit of capital rented

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is 50 baked goods per hour; the hourly wage rate for labor is $8 and the hourly rental price for capital is $5. To minimize the cost of producing its current level of output, should Bobby's Bakehouse rent more capital, less capital, or the same amount of capital? Explain using marginal analysis.

1. Respond to parts of the question.

Part A

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that there will be a shortage at a wage of $13, calculates the shortage as 45 bakers, and shows the work.

$$\text{Shortage} = \text{Quantity Demanded} - \text{Quantity Supplied} = 135 - 90 = 45$$

Part B

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response identifies the profit-maximizing number of workers as 90 and explains that at that quantity, the marginal revenue product is equal to the marginal factor cost.

Part C

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response identifies the wage the firm will pay as $13 and explains that this is the wage on the supply curve at the profit-maximizing number of workers (where marginal revenue product is equal to marginal factor cost).

Part D

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

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0	1 ✓

The response states that the quantity of output produced will increase and explains that as each worker's extra output (marginal product) increases, the firm's MRP increases, increasing the quantity of labor hired as well as the quantity of output produced by the firm.

Part E

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that the firm should rent more capital and explains that the ratio of the marginal product of labor to the wage (2) is less than the ratio of the marginal product of capital to the rental price of capital (10), or the firm can get more output for their money by renting more capital, or

$$\frac{MP_{Labor}}{P_{Labor}} < \frac{MP_{Capital}}{P_{Capital}}$$

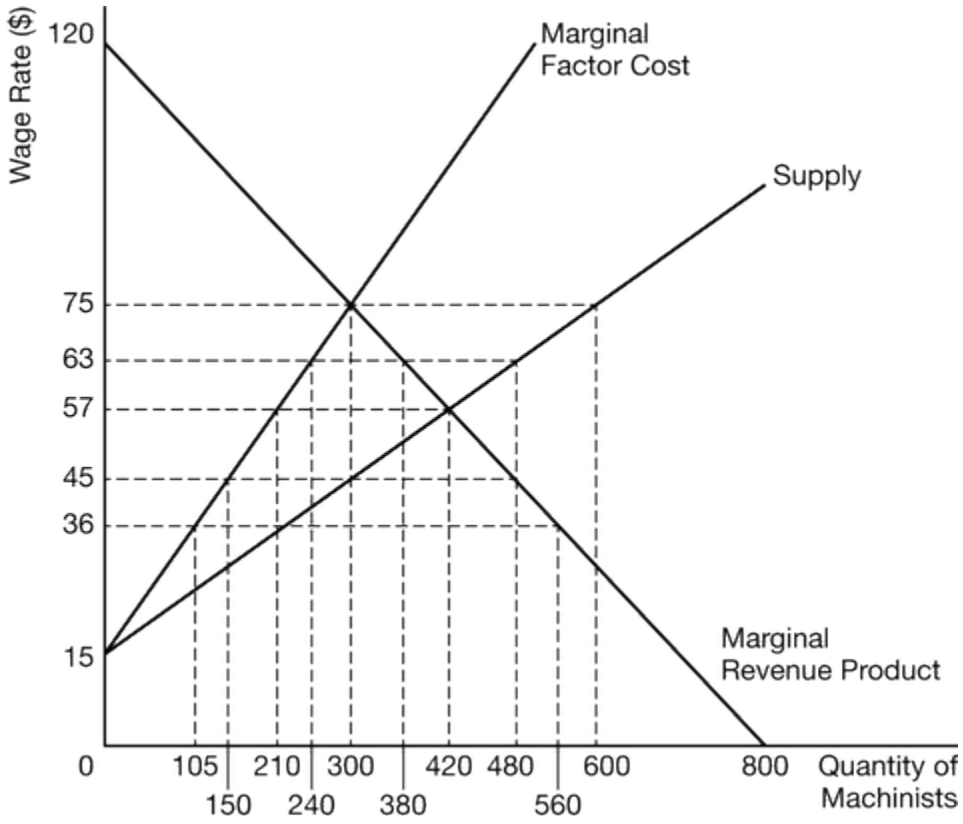
$$\frac{16}{8} < \frac{50}{5}$$

$$2 < 10$$

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Include correctly labeled diagrams, if useful or required, in explaining your answers. A correctly labeled diagram must have all axes and curves clearly labeled and must show directional changes. If the question prompts you to "Calculate," you must show how you arrived at your final answer.

Central Manufacturing Company is the only manufacturing facility in a small remote town, and Central Manufacturing Company is the only employer of machinists in the area. The graph below shows the market for machinists with the marginal factor (resource) cost curve, the labor supply curve, and the marginal revenue product curve.



(a) If the wage rate is $63, state whether there will be a shortage or a surplus of machinists and calculate its size. Show your work.

(b) Identify the profit-maximizing number of machinists. Explain using the labeling on the graph.

(c) Identify the profit-maximizing wage rate that Central Manufacturing Company will pay its machinists. Explain using the labeling on the graph.

(d) If the marginal product of machinists increases, what will happen to the quantity of output produced by Central Manufacturing Company? Explain.

(e) Assume instead that Central Manufacturing Company uses both labor and capital in producing widgets. The marginal product of the last unit of labor hired is 120 widgets per day and the marginal product of the last unit of capital rented is

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150 widgets per day; the daily wage rate for labor is $40 and the daily rental price for capital is $30. To minimize the cost of producing its current level of output, should Central Manufacturing Company rent more capital, less capital, or the same amount of capital? Explain using marginal analysis.

2. Respond to all parts of the question.

Part A

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that there will be a surplus at a wage of $63, calculates the surplus as 100 workers, and shows the work.

$$\text{Surplus} = \text{Quantity Supplied} - \text{Quantity Demanded} = 480 - 380 = 100$$

Part B

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response identifies the profit-maximizing number of workers as 300 and explains that at that quantity, the marginal revenue product is equal to the marginal factor cost.

Part C

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response identifies the wage the firm will pay as $45 and explains that this is the wage on the supply curve at the profit-maximizing number of workers (where marginal revenue product is equal to marginal factor cost).

Part D

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

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0	1 ✓

The response states that the quantity of output produced will increase and explains that as each worker's extra output (marginal product) increases, the firm's MRP increases, increasing the quantity of labor hired as well as the quantity of output produced by the firm.

Part E

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that the firm should rent more capital and explains that the ratio of the marginal product of labor to the wage (3) is less than the ratio of the marginal product of capital to the rental price of capital (5), or the firm can get more output for their money by renting more capital, or

$$\frac{MP_{Labor}}{P_{Labor}} < \frac{MP_{Capital}}{P_{Capital}}$$

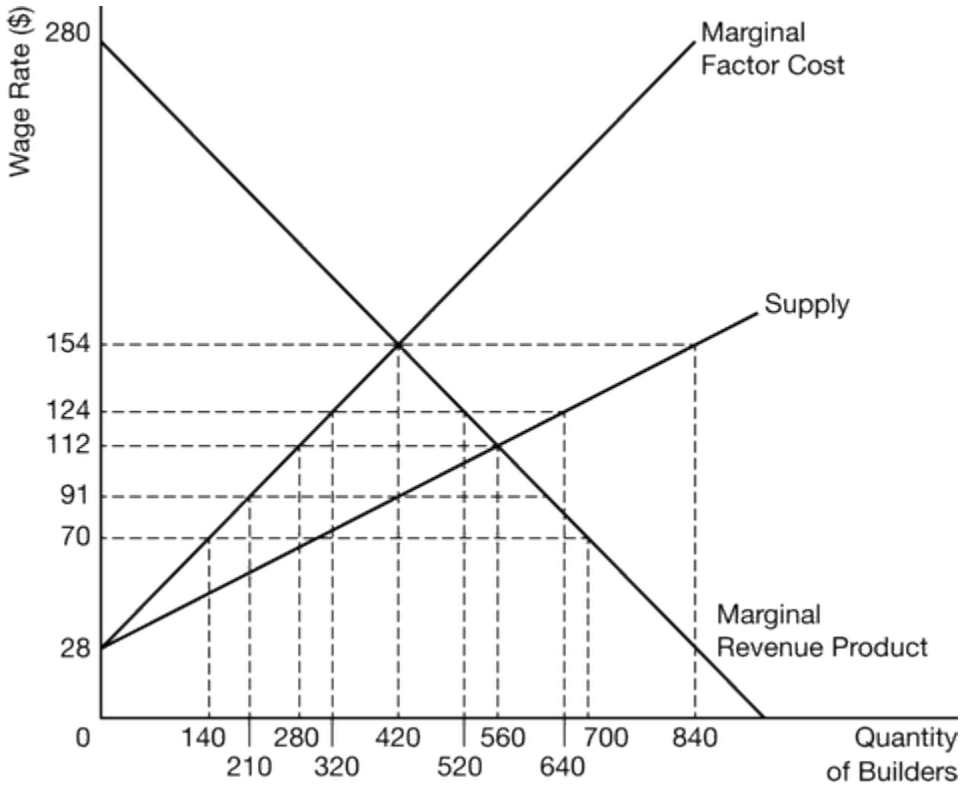
$$\frac{120}{40} < \frac{150}{30}$$

$$3 < 5$$

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Include correctly labeled diagrams, if useful or required, in explaining your answers. A correctly labeled diagram must have all axes and curves clearly labeled and must show directional changes. If the question prompts you to "Calculate," you must show how you arrived at your final answer.

Cornel's Construction is the only builder in a small remote town, and Cornel's Construction is the only employer of builders in the area. The graph below shows the market for builders with the marginal factor (resource) cost curve, the labor supply curve, and the marginal revenue product curve.



(a) If the wage rate is $124, state whether there will be a shortage or a surplus of builders and calculate its size. Show your work.

(b) Identify the profit-maximizing number of builders that Cornel's Construction will hire. Explain using the labeling on the graph.

(c) Identify the profit-maximizing wage rate that Cornel's Construction will pay its builders. Explain using the labeling on the graph.

(d) If the marginal product of builders increases, what will happen to the quantity of services provided by Cornel's Construction? Explain.

(e) Assume instead that Cornel's Construction uses both labor and capital in providing its services. The marginal product of the last unit of labor hired is 15 projects per hour and the marginal product of the last unit of capital rented is 10 projects per hour; the hourly wage rate for labor is $150 and the hourly rental price for capital is $50. To minimize the

cost of providing its current level of output, should Cornel's Construction rent more capital, less capital, or the same amount of capital? Explain using marginal analysis.

3. Respond to all parts of the question.

Part A

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that there will be a surplus at a wage of $124, calculates the surplus as 120 workers, and shows the work.

$$\text{Surplus} = \text{Quantity Supplied} - \text{Quantity Demanded} = 640 - 520 = 120$$

Part B

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response identifies the profit-maximizing number of workers as 420 and explains that at that quantity, the marginal revenue product is equal to the marginal factor cost.

Part C

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response identifies the wage the firm will pay as $91 and explains that this is the wage on the supply curve at the profit-maximizing number of workers (where marginal revenue product is equal to marginal factor cost).

Part D

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

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0	1 ✓

The response states that the quantity of services provided will increase and explains that as each worker's extra output (marginal product) increases, the firm's MRP increases, increasing the quantity of labor hired as well as the quantity of output produced by the firm.

Part E

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that the firm should rent more capital and explains that the ratio of the marginal product of labor to the wage (0.1) is less than the ratio of the marginal product of capital to the rental price of capital (0.2), or the firm can get more output for their money by renting more capital, or

$$\frac{MP_{Labor}}{P_{Labor}} < \frac{MP_{Capital}}{P_{Capital}}$$

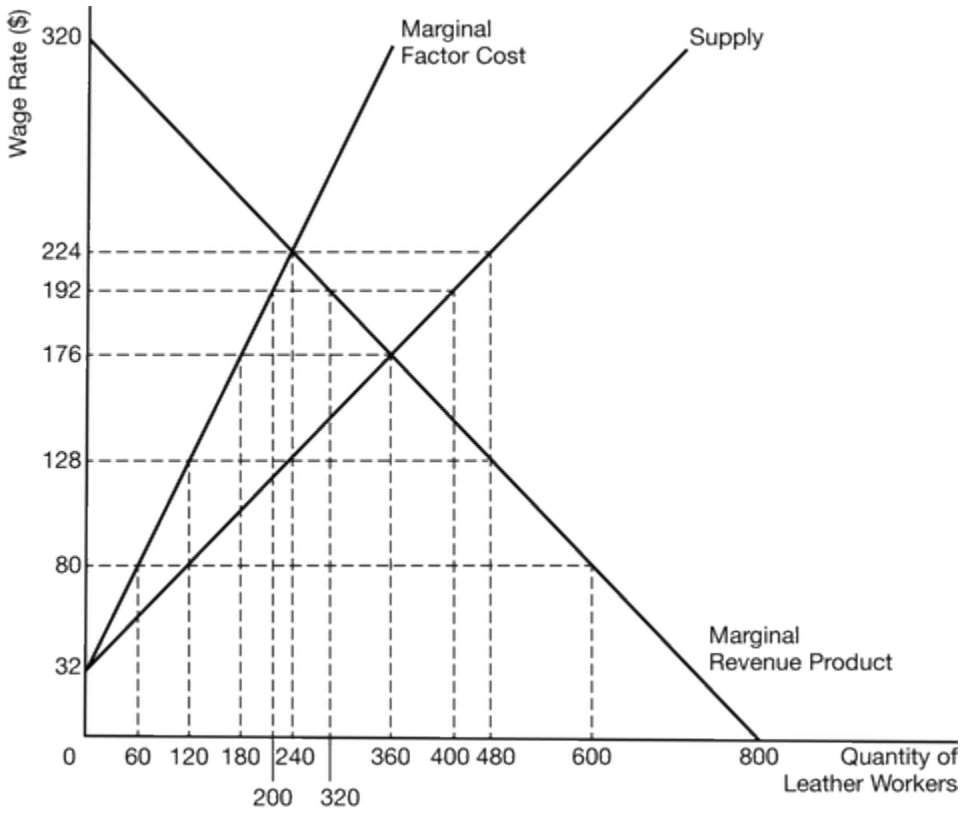
$$\frac{15}{150} < \frac{10}{50}$$

$$0.1 < 0.2$$

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Include correctly labeled diagrams, if useful or required, in explaining your answers. A correctly labeled diagram must have all axes and curves clearly labeled and must show directional changes. If the question prompts you to "Calculate," you must show how you arrived at your final answer.

Henri's Handbags is the only leather bags shop in a small remote town, and Henri's Handbags is the only employer of leather workers in the area. The graph below shows the market for leather workers with the marginal factor (resource) cost curve, the labor supply curve, and the marginal revenue product curve.



(a) If the wage rate is $192, state whether there will be a shortage or a surplus of leather workers and calculate its size. Show your work.

(b) Identify the profit-maximizing number of leather workers that Henri's Handbags will hire. Explain using the labeling on the graph.

(c) Identify the profit-maximizing wage rate that Henri's Handbags will pay its leather workers. Explain using the labeling on the graph.

(d) Assume that the market for leather workers becomes perfectly competitive. What wage rate would Henri's Handbags pay its leather workers if it were a perfectly competitive firm? Explain using labeling on the graph.

(e) Assume instead that Henri's Handbags uses both labor and capital in its production of handbags. The marginal product of the last unit of labor hired is 180 handbags per hour and the marginal product of the last unit of capital rented is 160

handbags per hour; the hourly wage rate for labor is $60 and the hourly rental price for capital is $20. To minimize the cost of producing its current level of output, should Henri's Handbags hire more leather workers, fewer leather workers, or the same number of leather workers? Explain using marginal analysis.

4. Respond to all parts of the question.

Part A

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that there will be a surplus at a wage of $192, calculates the surplus as 80 leather workers, and shows the work.

$$\text{Surplus} = \text{Quantity Supplied} - \text{Quantity Demanded} = 400 - 320 = 80$$

Part B

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response identifies the profit-maximizing number of workers as 240 and explains that at that quantity, the marginal revenue product is equal to the marginal factor cost.

Part C

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response identifies the wage the firm will pay as $128 and explains that this is the wage on the supply curve at the profit-maximizing number of workers (where marginal revenue product is equal to marginal factor cost).

Part D

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

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0	1 ✓

The response states that the perfectly competitive wage would be $176 and explains that the wage would be determined by the intersection of the supply curve and the marginal revenue product curve.

Part E

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that the firm should hire fewer leather workers and explains that the ratio of the marginal product of labor to the wage (3) is less than the ratio of the marginal product of capital to the rental price of capital (8), or the firm can get more output for their money by hiring fewer workers, or

$$\frac{MP_{Labor}}{P_{Labor}} < \frac{MP_{Capital}}{P_{Capital}}$$

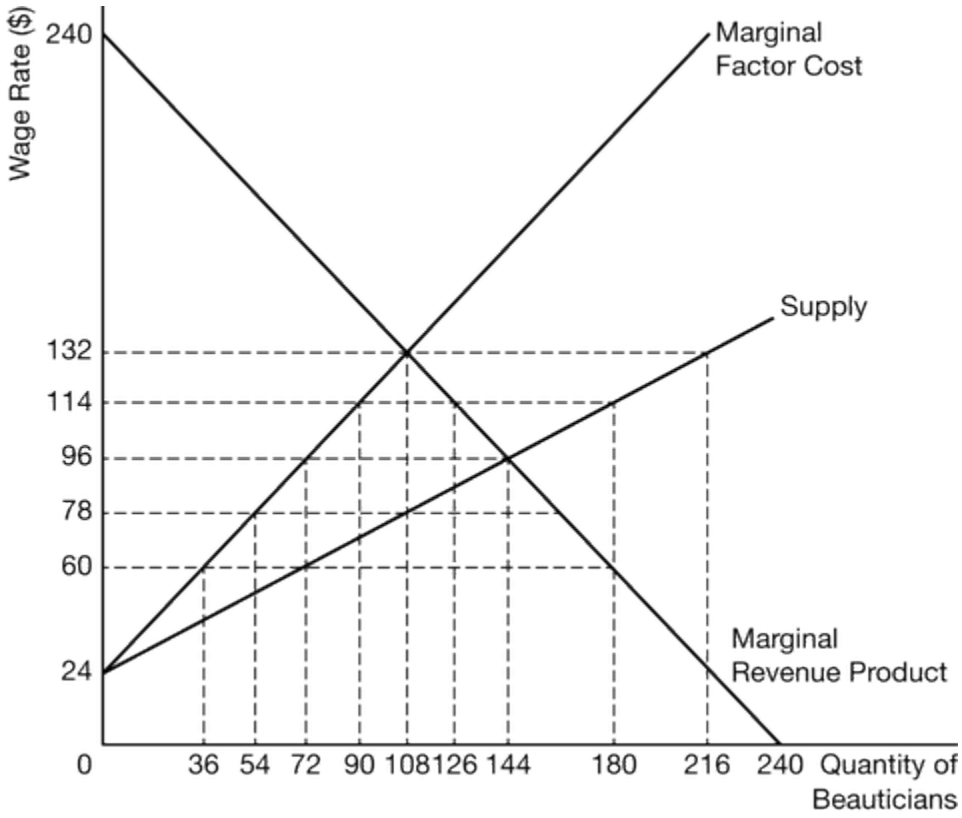
$$\frac{180}{60} < \frac{160}{20}$$

$$3 < 8$$

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Include correctly labeled diagrams, if useful or required, in explaining your answers. A correctly labeled diagram must have all axes and curves clearly labeled and must show directional changes. If the question prompts you to "Calculate," you must show how you arrived at your final answer.

Karen's Cuts is the only beauty salon in a small remote town, and Karen's Cuts is the only employer of beauticians in the area. The graph below shows the market for beauticians with the marginal factor (resource) cost curve, the labor supply curve, and the marginal revenue product curve.



(a Identify the profit-maximizing number of beauticians that Karen's Cuts will hire. Explain using the labeling on the graph.

(b) Identify the profit-maximizing wage rate that Karen's Cuts will pay its beauticians. Explain using the labeling on the graph.

(c) If the wage rate is $114, state whether there will be a shortage or a surplus of beauticians and calculate its size. Show your work.

(d) Assume that the market for beauticians becomes perfectly competitive. What wage rate would Karen's Cuts pay its beauticians if it were a perfectly competitive firm? Explain using labeling on the graph.

(e) Assume instead that Karen's Cuts uses both labor and capital in providing its services. The marginal product of the last unit of labor hired is 30 cuts per day and the marginal product of the last unit of capital rented is 20 cuts per day; the daily

wage rate for labor is $60 and the daily rental price for capital is $20. To minimize the cost of providing its current level of services, should Karen's Cuts hire more beauticians, fewer beauticians, or the same number of beauticians? Explain using marginal analysis.

5. Respond to all parts of the question.

Part A

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response identifies the profit-maximizing number of beauticians as 108 and explains that at that quantity, the marginal revenue product is equal to the marginal factor cost.

Part B

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response identifies the wage the firm will pay as $78 and explains that this is the wage on the supply curve at the profit-maximizing number of workers (where marginal revenue product is equal to marginal factor cost).

Part C

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that there will be a surplus at a wage of $114, calculates the surplus as 54 beauticians, and shows the work.

$$\text{Surplus} = \text{Quantity Supplied} - \text{Quantity Demanded} = 180 - 126 \ = 54$$

Part D

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

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0	1 ✓

The response states that the perfectly competitive wage would be $96 and explains that the wage would be determined by the intersection of the supply curve and the marginal revenue product curve.

Part E

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that the firm should hire fewer beauticians and explains that the ratio of the marginal product of labor to the wage (0.5) is less than the ratio of the marginal product of capital to the rental price of capital (1), or the firm can get more output for their money by hiring fewer workers, or

$$\frac{MP_{Labor}}{P_{Labor}} = \frac{MP_{Capital}}{P_{Capital}}$$

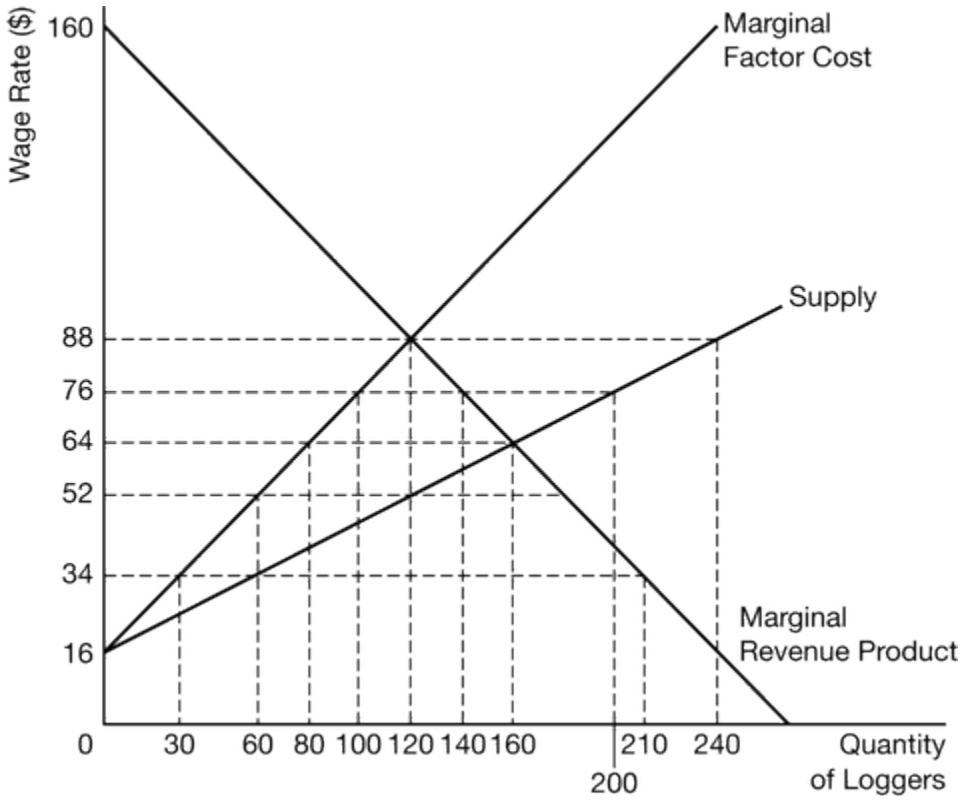
$$\frac{30}{60} > \frac{20}{20}$$

$$0.5 < 1$$

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Include correctly labeled diagrams, if useful or required, in explaining your answers. A correctly labeled diagram must have all axes and curves clearly labeled and must show directional changes. If the question prompts you to "Calculate," you must show how you arrived at your final answer.

Larry's Logging is the only logging company in a small remote town, and Larry's Logging is the only employer of loggers in the area. The graph below shows the market for loggers with the marginal factor (resource) cost curve, the labor supply curve, and the marginal revenue product curve.



(a) If the wage rate is $34, state whether there will be a shortage or a surplus of loggers and calculate its size. Show your work.

(b) Identify the profit-maximizing number of loggers that Larry's Logging will hire. Explain using the labeling on the graph.

(c) Identify the profit-maximizing wage rate that Larry's Logging will pay its loggers. Explain using the labeling on the graph.

(d) Assume that the market for loggers becomes perfectly competitive. What wage rate would Larry's Logging pay its loggers if it were a perfectly competitive firm? Explain using the labeling on the graph.

(e) Assume instead that Larry's Logging uses both labor and capital in its production of logs. The marginal product of the last unit of labor hired is 150 logs per hour and the marginal product of the last unit of capital rented is 200 logs per hour;

the hourly wage rate for labor is $30 and the hourly rental price for capital is $50. To minimize the cost of producing its current level of output, should Larry's Logging hire more loggers, fewer loggers, or the same number of loggers? Explain using marginal analysis.

6. Respond to all parts of the question.

Part A

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that there will be a shortage at a wage of $34, calculates the shortage as 150 loggers, and shows the work.

$$\text{Shortage} = \text{Quantity Demanded} - \text{Quantity Supplied} = 210 - 60 = 150$$

Part B

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response identifies the profit-maximizing number of loggers as 120 and explains that at that quantity, the marginal revenue product is equal to the marginal factor cost.

Part C

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response identifies the profit-maximizing wage the firm will pay as $52 and explains that this is the wage on the supply curve at the profit-maximizing number of loggers (where marginal revenue product is equal to marginal factor cost).

Part D

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

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0	1 ✓

The response states that the perfectly competitive wage would be $64 and explains that the wage would be determined by the intersection of the supply curve and the marginal revenue product curve.

Part E

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that the firm should hire more loggers and explains that the ratio of the marginal product of labor to the wage (5) is greater than the ratio of the marginal product of capital to the rental price of capital (4), or the firm can get more output for their money by hiring more workers, or

$$\frac{MP_{Labor}}{P_{Labor}} > \frac{MP_{Capital}}{P_{Capital}}$$

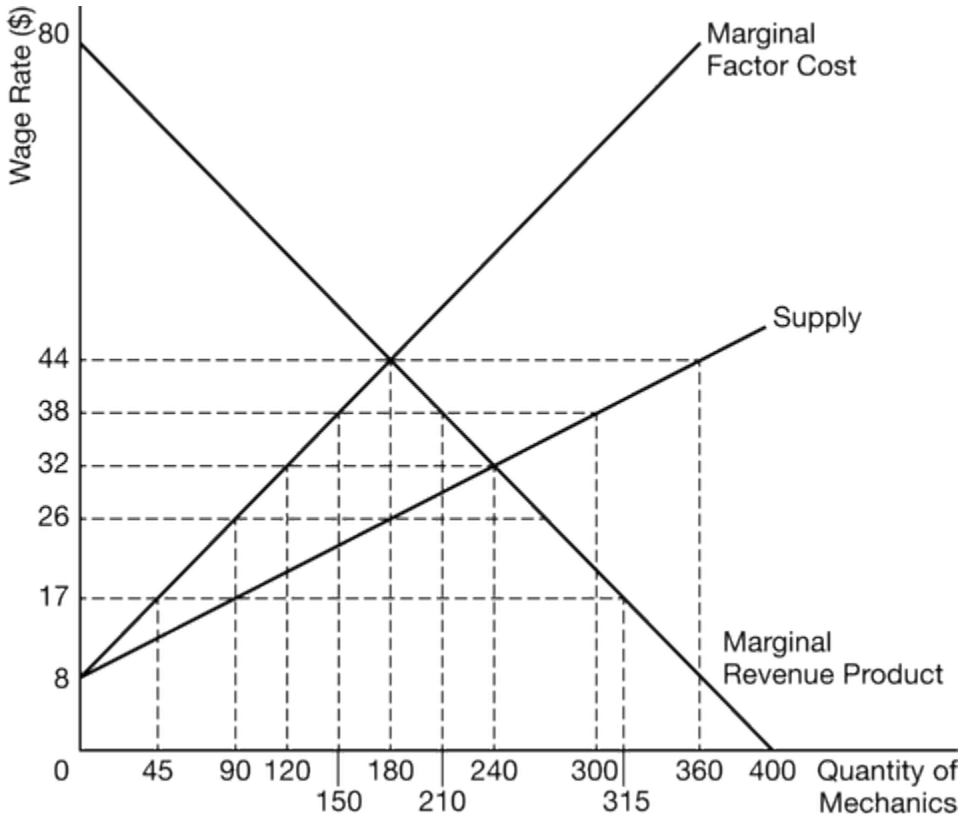
$$\frac{150}{30} > \frac{200}{50}$$

$$5 > 4$$

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Include correctly labeled diagrams, if useful or required, in explaining your answers. A correctly labeled diagram must have all axes and curves clearly labeled and must show directional changes. If the question prompts you to "Calculate," you must show how you arrived at your final answer.

Molly's Motorcycles is the only motorcycle repair shop in a small remote town, and Molly's Motorcycles is the only employer of mechanics in the area. The graph below shows the market for mechanics with the marginal factor (resource) cost curve, the labor supply curve, and the marginal revenue product curve.



(a) Identify the profit-maximizing number of mechanics that Molly's Motorcycles will hire. Explain using the labeling on the graph.

(b) Identify the profit-maximizing wage rate that Molly's Motorcycles will pay its mechanics. Explain using the labeling on the graph.

(c) If the wage rate is $38, state whether there will be a shortage or a surplus of mechanics and calculate its size. Show your work.

(d) If the marginal product of mechanics decreases, what will happen to the quantity of services provided by Molly's Motorcycles? Explain.

(e) Assume instead that Molly's Motorcycles uses both labor and capital in providing its services. The marginal product of the last unit of labor hired is 100 repairs per day and the marginal product of the last unit of capital rented is 60 repairs per

day; the daily wage rate for labor is $20 and the daily rental price for capital is $30. To minimize the cost of providing its current level of service, should Molly's Motorcycles rent more capital, less capital, or the same amount of capital? Explain using marginal analysis.

7. Respond to all parts of the question.

Part A

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response identifies 180 as the profit-maximizing number of beauticians and explains that at that quantity, the marginal revenue product is equal to the marginal factor cost.

Part B

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response identifies $26 as the wage the firm will pay and explains that this is the wage on the supply curve at the profit-maximizing number of workers (where marginal revenue product is equal to marginal factor cost).

Part C

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that there will be a surplus at a wage of $38, calculates the surplus as 90 mechanics, and shows the work.

$$\text{Surplus} = \text{Quantity Supplied} - \text{Quantity Demanded} = 300 - 210 = 90$$

Part D

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

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0	1 ✓

The response states that the quantity of services provided will decrease and explains that as each worker's extra output (marginal product) decreases, the firm's MRP decreases, decreasing the quantity of labor hired as well as the quantity of output produced by the firm.

Part E

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that the firm should rent less capital and explains that the ratio of the marginal product of labor to the wage (5) is greater than the ratio of the marginal product of capital to the rental price of capital (2), or the firm can get more output for their money by renting less capital, or

$$\frac{MP_{Labor}}{P_{Labor}} > \frac{MP_{Capital}}{P_{Capital}}$$

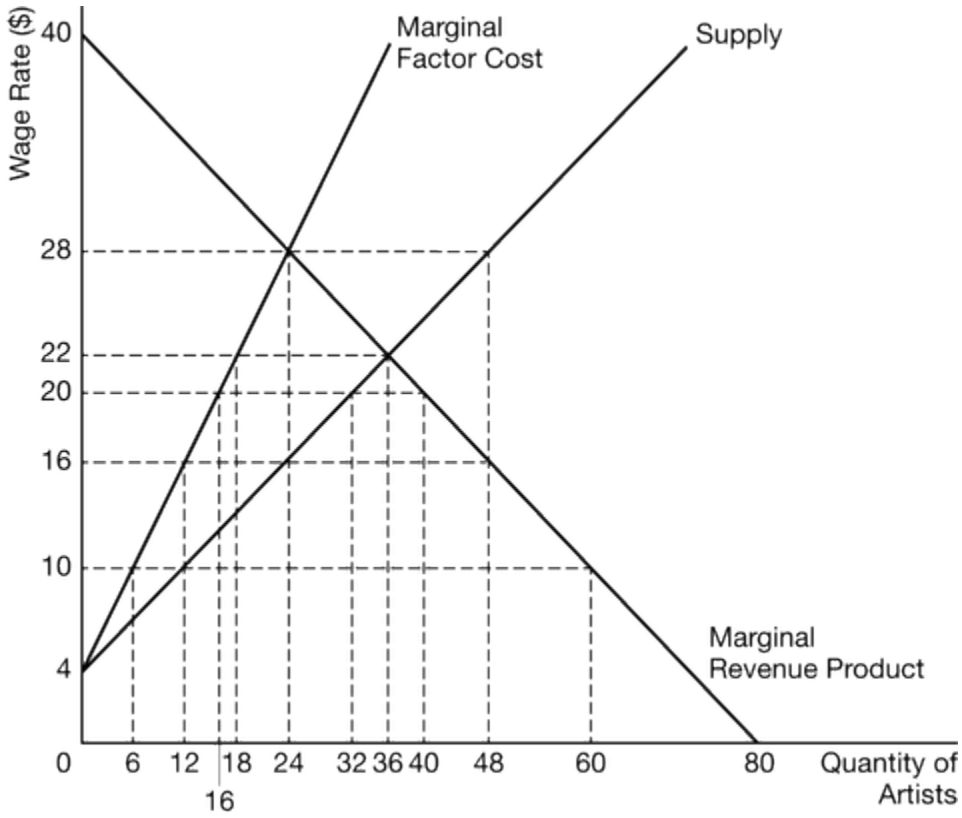
$$\frac{100}{20} > \frac{60}{30}$$

$$5 > 2$$

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***Include correctly labeled diagrams, if useful or required, in explaining your answers. A correctly labeled diagram must have all axes and curves clea*rly labeled and must show directional changes. If the question prompts you to "Calculate," you must show how you arrived at your final answer.**

Tandy's Art is the only art studio and workshop in a small remote town, and Tandy's Art is the only employer of artists in the area. The graph below shows the market for artists with the marginal factor (resource) cost curve, the labor supply curve, and the marginal revenue product curve.



(a) Identify the profit-maximizing number of artists that Tandy's Art will hire. Explain using the labeling on the graph.

(b) Identify the profit-maximizing wage rate that Tandy's Art will pay its artists. Explain using the labeling on the graph.

(c) If the wage rate is $10, state whether there will be a shortage or a surplus of artists and calculate its size. Show your work.

(d) Assume that the market for artists becomes perfectly competitive. What wage rate would Tandy's Art pay its artists if it were a perfectly competitive firm? Explain using labeling on the graph.

(e) Assume instead that Tandy's Art uses both labor and capital in its production of artwork. The marginal product of the last unit of labor hired is 90 pieces of artwork per day and the marginal product of the last unit of capital rented is 80 pieces of artwork per day; the daily wage rate for labor is $10 and the daily rental price for capital is $20. To minimize the cost of providing its current level of output, should Tandy's Art hire more artists, fewer artists, or the same number of

artists? Explain using marginal analysis.

8. Respond to all parts of the question.

Part A

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response identifies the profit-maximizing number of artists as 24 and explains that at that quantity, the marginal revenue product is equal to the marginal factor cost.

Part B

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response identifies the wage the firm will pay as $16 and explains that this is the wage on the supply curve at the profit-maximizing number of workers (where marginal revenue product is equal to marginal factor cost).

Part C

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that there will be a shortage at a wage of $10, calculates the shortage as 48 artists, and shows the work.

$$\text{Shortage} = \text{Quantity Demanded} - \text{Quantity Supplied} = 60 - 12 = 48$$

Part D

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

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The response states that the perfectly competitive wage would be $22 and explains that the wage would be determined by the intersection of the supply curve and the marginal revenue product curve.

Part E

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that the firm should hire more artists and explains that the ratio of the marginal product of labor to the wage (9) is greater than the ratio of the marginal product of capital to the rental price of capital (4), or the firm can get more output for its money by hiring more workers and renting less capital, or

$$\frac{MP_{Labor}}{P_{Labor}} > \frac{MP_{Capital}}{P_{Capital}}$$

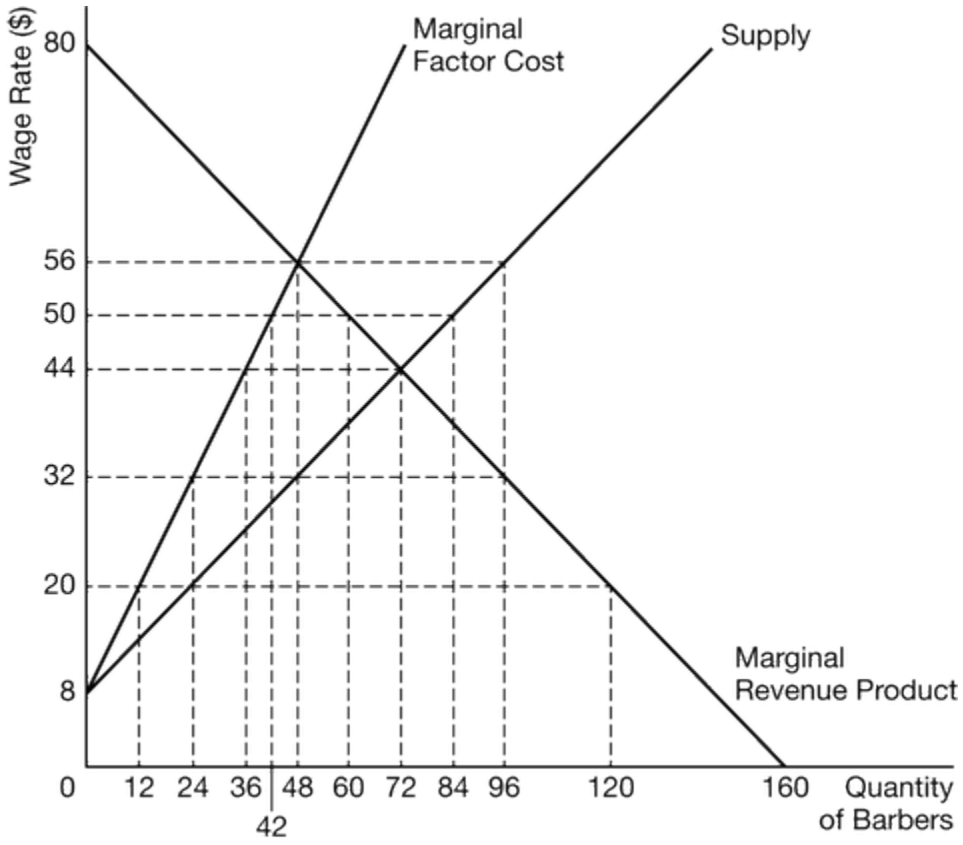
$$\frac{90}{10} > \frac{80}{20}$$

$$9 > 4$$

2020 Short - Set 2

Include correctly labeled diagrams, if useful or required, in explaining your answers. A correctly labeled diagram must have all axes and curves clearly labeled and must show directional changes. If the question prompts you to "Calculate," you must show how you arrived at your final answer.

Tom's Trims is the only barber shop in a small remote town, and Tom's Trims is the only employer of barbers in the area. The graph below shows the market for barbers with the marginal factor (resource) cost curve, the labor supply curve, and the marginal revenue product curve.



(a) If the wage rate is $20, state whether there will be a shortage or a surplus of barbers and calculate its size. Show your work.

(b) Identify the profit-maximizing number of barbers that Tom's Trims will hire. Explain using the labeling on the graph.

(c) Identify the profit-maximizing wage rate that Tom's Trims will pay its barbers. Explain using the labeling on the graph.

(d) Assume that the market for barbers becomes perfectly competitive. What wage rate would Tom's Trims pay its barbers if it were a perfectly competitive firm? Explain using labeling on the graph.

(e) Assume instead that Tom's Trims uses both labor and capital in providing its services. The marginal product of the last unit of labor hired is 80 cuts per day and the marginal product of the last unit of capital rented is 120 cuts per day; the

daily wage rate for labor is $20 and the daily rental price for capital is $40. To minimize the cost of producing its current level of output, should Tom's Trims hire more barbers, fewer barbers, or the same number of barbers? Explain using marginal analysis.

9. Respond to all parts of the question.

Part A

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that there will be a shortage at a wage of $20, calculates the shortage as 96 barbers, and shows the work.

$$\text{Shortage} = \text{Quantity Demanded} - \text{Quantity Supplied} = 120 - 24 = 96$$

Part B

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response identifies the profit-maximizing number of barbers as 48 and explains that at that quantity, the marginal revenue product is equal to the marginal factor cost.

Part C

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response identifies the wage the firm will pay as $32and explains that this is the wage on the supply curve at the profit-maximizing number of workers (where marginal revenue product is equal to marginal factor cost).

Part D

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

2020 Short - Set 2

0	1 ✓

The response states that the perfectly competitive wage would be $44 and explains that the wage would be determined by the intersection of the supply curve and the marginal revenue product curve.

Part E

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that the firm should hire more barbers and explains that the ratio of the marginal product of labor to the wage (4) is greater than the ratio of the marginal product of capital to the rental price of capital (3), or the firm can get more output for their money by hiring more workers, or

$$\frac{MP_{Labor}}{P_{Labor}} > \frac{MP_{Capital}}{P_{Capital}}$$

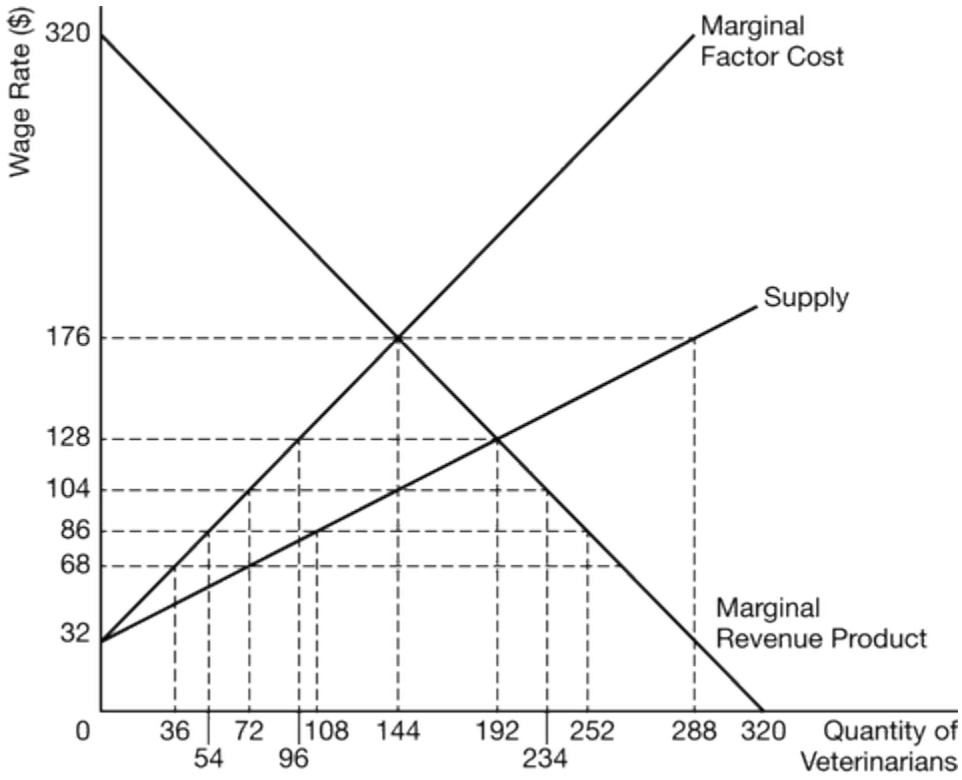
$$\frac{80}{20} > \frac{120}{40}$$

$$4 > 3$$

2020 Short - Set 2

Include correctly labeled diagrams, if useful or required, in explaining your answers. A correctly labeled diagram must have all axes and curves clearly labeled and must show directional changes. If the question prompts you to "Calculate," you must show how you arrived at your final answer.

Vijay's Veterinary is the only animal care facility in a small remote town, and Vijay's Veterinary is the only employer of veterinarians in the area. The graph below shows the market for veterinarians with the marginal factor (resource) cost curve, the labor supply curve, and the marginal revenue product curve.



(a) Identify the profit-maximizing number of veterinarians that Vijay's Veterinary will hire. Explain using the labeling on the graph.

(b) Identify the profit-maximizing wage rate that Vijay's Veterinary will pay its veterinarians. Explain using the labeling on the graph.

(c) If the wage rate is $86, state whether there will be a shortage or a surplus of veterinarians and calculate its size. Show your work.

(d) If the marginal product of veterinarians decreases, what will happen to the quantity of services provided by Vijay's Veterinary? Explain.

(e) Assume instead that Vijay's Veterinary uses both labor and capital in providing its services. The marginal product of the last unit of labor hired is 50 patients per day and the marginal product of the last unit of capital rented is 10 patients per day; the daily wage rate for labor is $100 and the daily rental price for capital is $40. To minimize the cost of

providing its current level of service, should Vijay's Veterinary rent more capital, less capital, or the same amount of capital? Explain using marginal analysis.

10. Respond to all parts of the question.

Part A

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response identifies the profit-maximizing number of workers as 144 and explains that at that quantity, the marginal revenue product is equal to the marginal factor cost.

Part B

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response identifies the wage the firm will pay as $104 and explains that this is the wage on the supply curve at the profit-maximizing number of workers (where marginal revenue product is equal to marginal factor cost).

Part C

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that there will be a shortage at a wage of $86, calculates the shortage as 144 veterinarians, and shows the work.

$$\text{Shortage} = \text{Quantity Demanded} - \text{Quantity Supplied} = 252 - 108 = 144$$

Part D

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

2020 Short - Set 2

0	1 ✓

The response states that the quantity of services provided will decrease and explains that as each worker's extra output (marginal product) decreases, the firm's MRP decreases, decreasing the quantity of labor hired as well as the quantity of output produced by the firm.

Part E

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that the firm should rent less capital and explains that the ratio of the marginal product of labor to the wage (0.5) is greater than the ratio of the marginal product of capital to the rental price of capital (0.25), or the firm can get more output for their money by hiring more workers and renting less capital, or

$$\frac{MP_{Labor}}{P_{Labor}} > \frac{MP_{Capital}}{P_{Capital}}$$

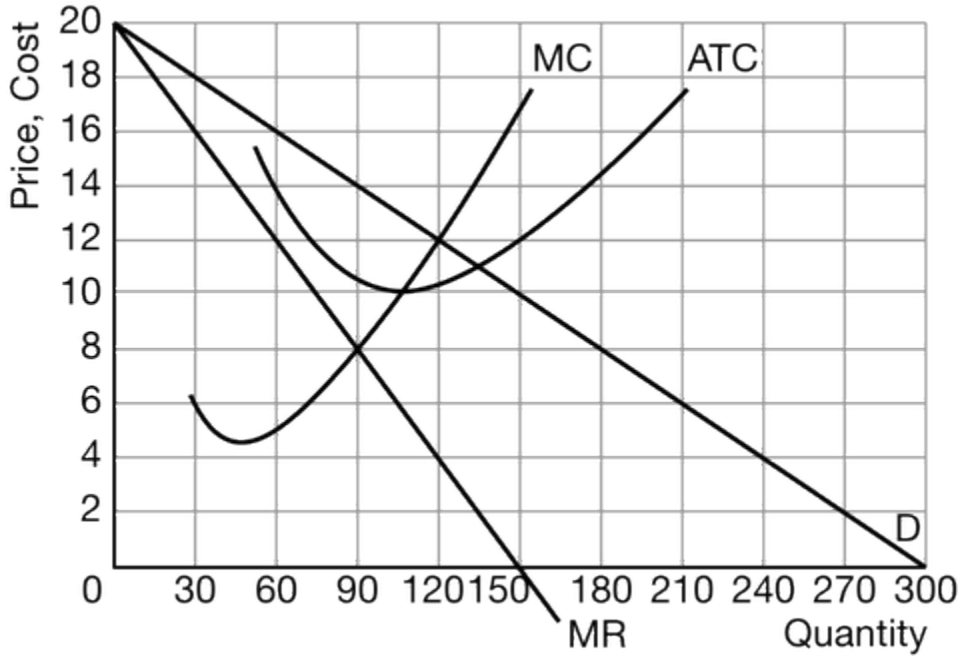
$$\frac{50}{100} > \frac{10}{40}$$

$$0.5 > 0.25$$

2020 Short - Set 2

Include correctly labeled diagrams, if useful or required, in explaining your answers. A correctly labeled diagram must have all axes and curves clearly labeled and must show directional changes. If the question prompts you to "Calculate," you must show how you arrived at your final answer.

Use the following graph to answer parts (a)-(e). Prices and costs are in dollars.



The graph above shows the demand (D), marginal revenue (MR), marginal cost (MC), and average total cost (ATC) curves for one of many profit-maximizing firms operating in the short run in an industry in which there are no barriers to entry. Each firm sells a similar but not identical product.

(a) What will happen to total revenue if the firm raises the price from $\$12$ to $\$16$? Explain.

(b) At 120 units, is the firm producing at the allocatively efficient quantity? Explain.

(c) If the firm produces 90 units, will the firm's economic profit be positive, negative, or zero? Explain.

(d) Use the relationship between the marginal cost curve and the average total cost curve to explain why the average total cost curve is decreasing at 60 units.

(e) Calculate the consumer surplus if the firm charges the profit-maximizing price. Show your work.

11. Respond to all parts of the question.

Part A

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

2020 Short - Set 2

0	1 ✓

The response states that total revenue will decrease and explains that demand is price elastic in this price range; or uses numbers to explain that the percentage decrease in quantity demanded is greater than the percentage increase in price, the absolute value of the price elasticity of demand is greater than 1, or the total revenue decreases.

Part B

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that yes, the firm is producing at the allocatively efficient quantity and explains that allocative efficiency is achieved when the marginal cost to producers equals the marginal benefit to consumers, which occurs where the demand curve intersects the marginal cost curve (at 120 units).

Part C

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that at 90 units the firm’s economic profit is positive and explains that the price is above the ATC.

Part D

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response explains that at 60 units marginal cost is less than average total cost, which means that the cost of producing the next unit is lower than the average total cost, which pulls down the average total cost for the next unit.

Part E

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

2020 Short - Set 2

0	1 ✓

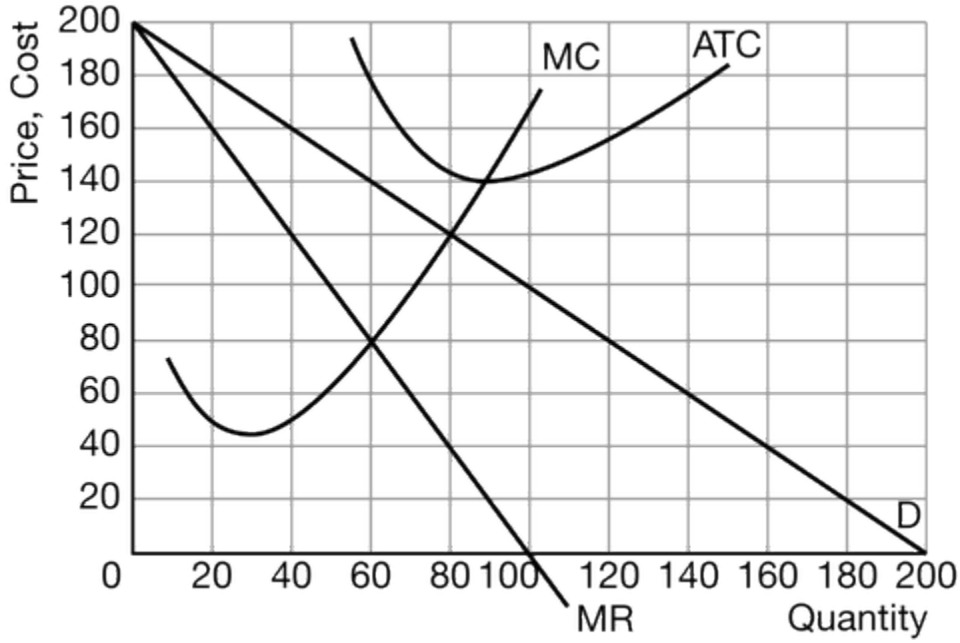
The response calculates the consumer surplus as $270 and shows the work:

$$\text{Consumer Surplus} = \frac{1}{2}(90)(\$20 - \$14) = \$270$$

2020 Short - Set 2

Include correctly labeled diagrams, if useful or required, in explaining your answers. A correctly labeled diagram must have all axes and curves clearly labeled and must show directional changes. If the question prompts you to "Calculate," you must show how you arrived at your final answer.

Use the following graph to answer parts (a)-(e). Prices and costs are in dollars.



The graph above shows the demand (D), marginal revenue (MR), marginal cost (MC), and average total cost (ATC) curves for one of many profit-maximizing firms operating in the short run in an industry in which there are no barriers to entry. Each firm sells a similar but not identical product.

(a) Calculate the total revenue of producing 40 units. Show your work.

(b) For quantities between 160 and 180 units, is the demand curve elastic, inelastic, or unit elastic? Explain.

(c) Assume that this firm is currently charging a price of $\$100$. In order to maximize its profit, should the firm increase its price, decrease its price, or keep its price the same? Explain.

(d) At a quantity of 20 units, does this firm have increasing marginal returns or diminishing marginal returns? Explain.

(e) Identify the firm's allocatively efficient quantity, and explain how you determined it.

12. Respond to all parts of the question.

Part A

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

2020 Short - Set 2

0	1 ✓

The response calculates the total revenue of producing 40 units as $6400 and shows the work.

$$\text{Total Revenue} = \text{Price} \times \text{Quantity} = \$160 \times 40 = \$6{,}400$$

Part B

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that the demand curve is inelastic for quantities between 160 and 180 units and explains that the marginal revenue is negative; or uses numbers to explain that total revenue is falling as the price declines in that quantity range, the percentage change in quantity demanded is less than the percentage change in price, or the absolute value of the price elasticity of demand is less than 1.

Part C

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that the firm should increase its price and explains that at a price of $100 the marginal cost is greater than the marginal revenue or explains that the profit-maximizing price is $140 (this is the price from the demand curve for the profit-maximizing quantity of 60 units where marginal cost is equal to marginal revenue).

Part D

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that the firm has increasing marginal returns and explains that marginal cost is falling at the quantity of 20 units, indicating that the marginal product is rising.

Part E

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

2020 Short - Set 2

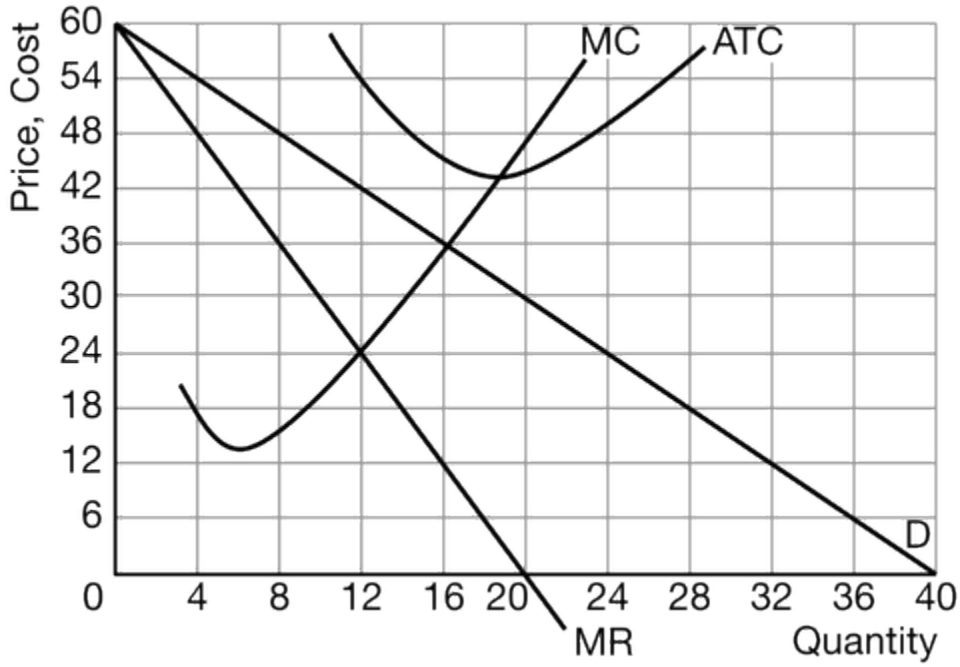
0	1 ✓

The response identifies that the allocatively efficient quantity is 80 units and explains that allocative efficiency is achieved when the marginal cost to producers equals the marginal benefit to consumers, which occurs where the demand curve intersects the marginal cost curve.

2020 Short - Set 2

Include correctly labeled diagrams, if useful or required, in explaining your answers. A correctly labeled diagram must have all axes and curves clearly labeled and must show directional changes. If the question prompts you to "Calculate," you must show how you arrived at your final answer.

Use the following graph to answer parts (a)-(e). Prices and costs are in dollars.



The graph above shows the demand (D) , marginal revenue (MR), marginal cost (MC), and average total cost (ATC) curves for one of many profit-maximizing firms operating in the short run in an industry in which there are no barriers to entry. Each firm sells a similar but not identical product.

(a) Assume the firm produces 16 units. Will the firm's economic profit be positive, negative, or zero? Explain.

(b) If the firm charges $\$36$, should this firm increase its price, decrease its price, or keep the price at $\$36$ in order to maximize its total revenue? Explain.

(c) If the firm increases its price from $\$36$ to $\$42$, does the deadweight loss increase, decrease, or remain unchanged? Explain.

(d) Assuming the firm produces a quantity greater than zero, identify the firm's profit-maximizing quantity and price, and explain how you determined each.

(e) Calculate the total cost of producing the profit-maximizing quantity identified in part (c). Show your work.

13. Respond to all parts of the question.

Part A

2020 Short - Set 2

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that at 16 units the firm's economic profit is negative (economic loss) and explains that the price is below the ATC.

Part B

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that the firm should decrease its price and explains that when demand is elastic (the portion of the demand curve where marginal revenue is greater than zero), a lower price leads to more total revenue, or at $30 the firm produces the quantity where marginal revenue is zero and total revenue is maximized.

Part C

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that deadweight loss increases and explains that the firm produces farther away from the allocatively efficient quantity, where marginal cost equals price.

Part D

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response does both of the following:

· Identifies that the firm's profit-maximizing quantity is 12 units and explains that at that quantity marginal revenue is equal to marginal cost.

· Identifies that the firm's profit-maximizing price is $42 and explains that it is the price on the demand curve at the profit-maximizing quantity (where marginal revenue is equal to marginal cost).

2020 Short - Set 2

Part E

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

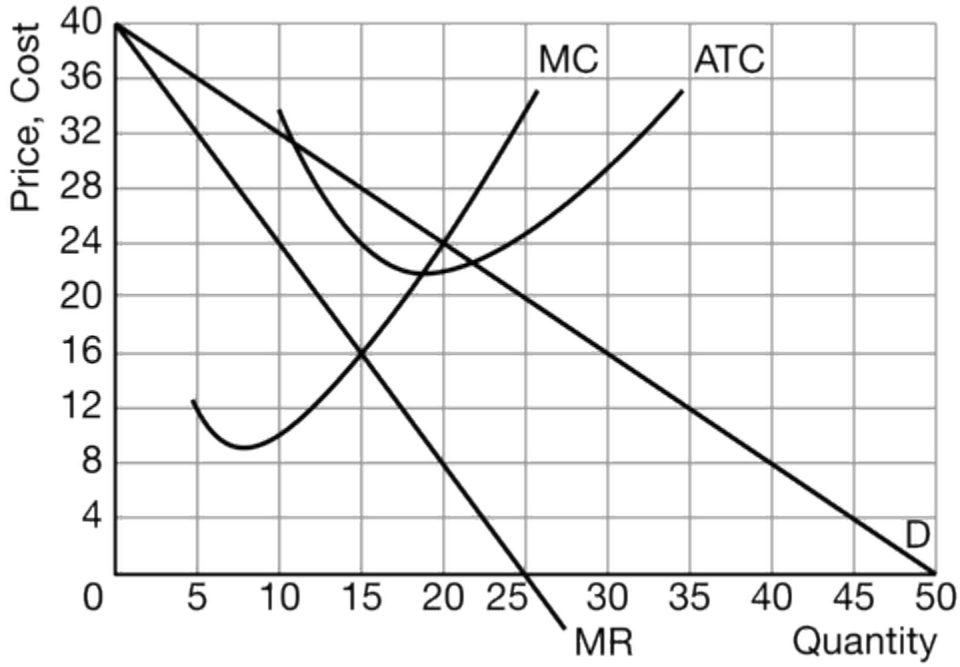
The response calculates total cost as $648 and shows the work.

$$\text{Total Cost} = \text{Average Total Cost} \times \text{Quantity} = \$54 \times 12 = \$648$$

2020 Short - Set 2

Include correctly labeled diagrams, if useful or required, in explaining your answers. A correctly labeled diagram must have all axes and curves clearly labeled and must show directional changes. If the question prompts you to "Calculate," you must show how you arrived at your final answer.

*Use the following gra*ph to answer parts (a)-(e). Prices and costs are in dollars.



The graph above shows the demand (D), marginal revenue (MR), marginal cost (MC), and average total cost (ATC) curves for one of many profit-maximizing firms operating in the short run in an industry in which there are no barriers to entry. Each firm sells a similar but not identical product.

(a) Assume the firm produces 20 units. Will the firm's economic profit be positive, negative, or zero? Explain.

(b) If the firm charges $\$12$, should this firm increase its price, decrease its price, or keep the price at $\$12$ in order to maximize its total revenue? Explain.

(c) If the firm decreases its price from $\$32$ to $\$28$, does the deadweight loss increase, decrease, or remain unchanged? Explain.

(d) Identify the profit-maximizing quantity and price, and explain how you determined each.

(e) Calculate the total cost of producing the profit-maximizing quantity identified in part (d). Show your work.

14. Respond to all parts of the question.

Part A

2020 Short - Set 2

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that at 20 units the firm's economic profit is positive and explains that the price is above the ATC.

Part B

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that the firm should increase it price and explains that when demand is inelastic (the portion of the demand curve where marginal revenue is greater than zero), a higher price leads to more total revenue, or at $20 the firm produces the quantity where marginal revenue is zero and total revenue is maximized.

Part C

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that deadweight loss decreases and explains that the firm produces closer to the allocatively efficient quantity, where marginal cost equals price.

Part D

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response does both of the following:

· Identifies that the firm's profit-maximizing quantity is 15 units and explains that at that quantity marginal revenue is equal to marginal cost.

· Identifies that the firm's profit-maximizing price is $28 and explains that it is the price on the demand curve at the profit-maximizing quantity (where marginal revenue is equal to marginal cost).

Part E

2020 Short - Set 2

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

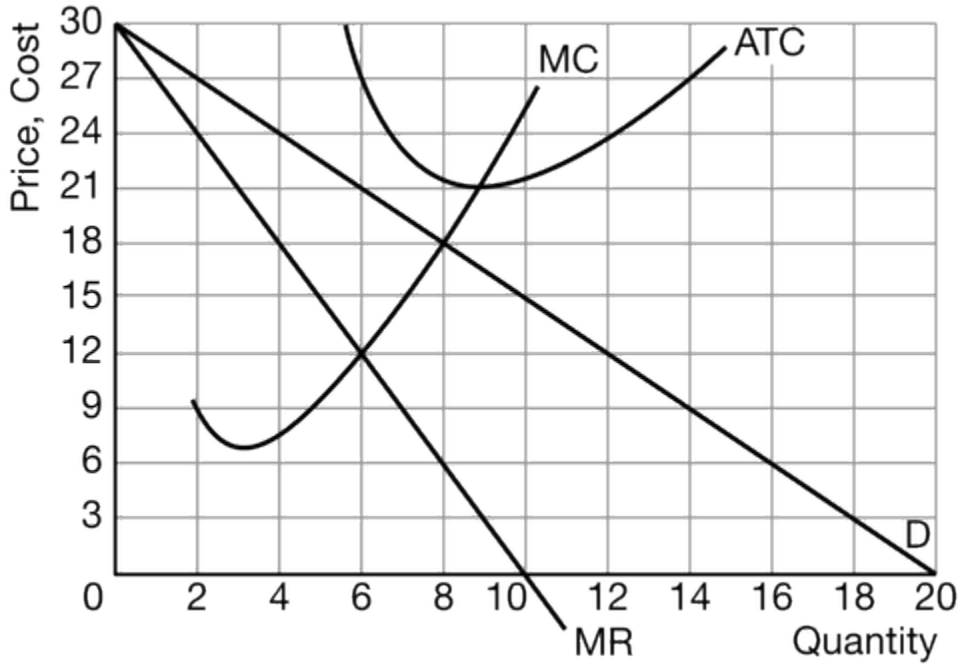
The response calculates total cost as $360 and shows the work.

$$\text{Total Cost} = \text{Average Total Cost} \times \text{Quantity} = \$24 \times 15 = \$360$$

2020 Short - Set 2

Include correctly labeled diagrams, if useful or required, in explaining your answers. A correctly labeled diagram must have all axes and curves clearly labeled and must show directional changes. If the question prompts you to "Calculate," you must show how you arrived at your final answer.

Use the following graph to answer parts (a)-(e). Prices and costs are in dollars.



The graph above shows the demand (D), marginal revenue (MR), marginal cost (MC), and average total cost (ATC) curves for one of many profit-maximizing firms operating in the short run in an industry in which there are no barriers to entry. Each firm sells a similar but not identical product.

(a) Assume the firm produces 8 units. Will the firm's economic profit be positive, negative, or zero? Explain

(b) If the firm charges $\$18$, should this firm increase its price, decrease its price, or keep the price at $\$18$ in order to maximize its total revenue? Explain.

(c) If the firm increases its price from $\$21$ to $\$24$, does the deadweight loss increase, decrease, or remain unchanged? Explain.

(d) Assuming the firm produces a quantity greater than zero, identify the profit-maximizing quantity and price, and explain how you determined each.

(e) Calculate the total cost of producing the profit-maximizing quantity identified in part (d). Show your work.

15. Respond to all parts of the question.

Part A

2020 Short - Set 2

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that at 8 units the firm's economic profit is negative (economic loss) and explains that the price is below the ATC.

Part B

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that the firm should decrease its price and explains that when demand is elastic (the portion of the demand curve where marginal revenue is greater than zero), a lower price leads to more total revenue, or at $15 the firm produces the quantity where marginal revenue is zero and total revenue is maximized.

Part C

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that deadweight loss increases and explains that the firm produces farther away from the allocatively efficient quantity, where marginal cost equals price.

Part D

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response does both of the following:

· Identifies that the firm's profit-maximizing quantity is 6 units and explains that at that quantity marginal revenue is equal to marginal cost.

· Identifies that the firm's profit-maximizing price is $21 and explains that it is the price on the demand curve at the profit-maximizing quantity (where marginal revenue is equal to marginal cost).

2020 Short - Set 2

Part E

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

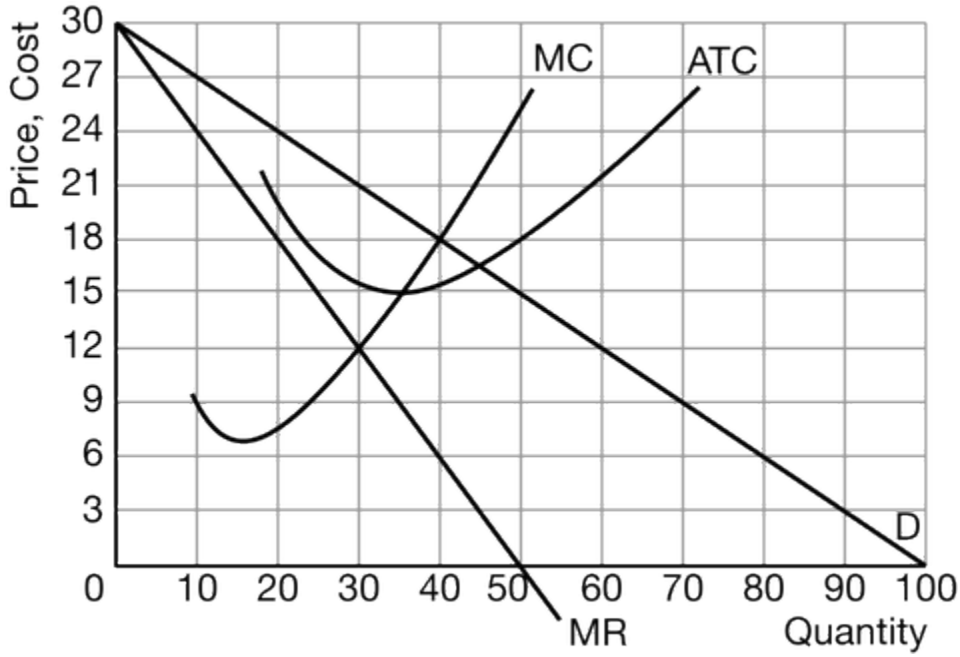
The response calculates total cost as $162 and shows the work.

$$\text{Total Cost} = \text{Average Total Cost} \times \text{Quantity} = \$27 \times 6 = \$162$$

2020 Short - Set 2

Include correctly labeled diagrams, if useful or required, in explaining your answers. A correctly labeled diagram must have all axes and curves clearly labeled and must show directional changes. If the question prompts you to "Calculate," you must show how you arrived at your final answer.

Use the following graph to answer parts (a)-(e). Prices and costs are in dollars.



The graph above shows the demand (D), marginal revenue (MR), marginal cost (MC), and average total cost (ATC) curves for one of many profit-maximizing firms operating in the short run in an industry in which there are no barriers to entry. Each firm sells a similar but not identical product.

(a) At what quantity is the demand for this product unit elastic? Explain.

(b) Use the relationship between the marginal cost curve and the average total cost curve to explain why the average total cost curve is increasing at 40 units.

(c) If the firm maximizes profit, identify the profit-maximizing quantity and price, and explain how you determined each.

(d) Calculate the deadweight loss at the profit-maximizing quantity identified in part (c). Show your work.

(e) Assume fixed cost increases by $\$6$. Will the profit-maximizing quantity increase, decrease, or stay the same in the short run? Explain.

16. Respond to parts of the question.

Part A

2020 Short - Set 2

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that the demand curve is unit elastic at the quantity of 50 units and explains that the marginal revenue is zero, or uses numbers to explain that total revenue is maximized at this quantity or that the absolute value of the price elasticity of demand is 1.

Part B

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response explains that at 40 units marginal cost exceeds average total cost, which means that the additional cost of producing the next unit is higher than the average total cost, which pulls the average total cost up for the next unit.

Part C

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response does both of the following:

· Identifies that the firm's profit-maximizing quantity is 30 units and explains that at that quantity marginal revenue is equal to marginal cost.

· Identifies that the firm's profit-maximizing price is $21 and explains that it is the price on the demand curve at the profit-maximizing quantity (where marginal revenue is equal to marginal cost).

Part D

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response calculates the deadweight loss at the profit-maximizing quantity as $45 and shows the work.

$$\text{Deadweight Loss} = \frac{1}{2}(\$21 - \$12)(40 - 30) = \$45$$

2020 Short - Set 2

Part E

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

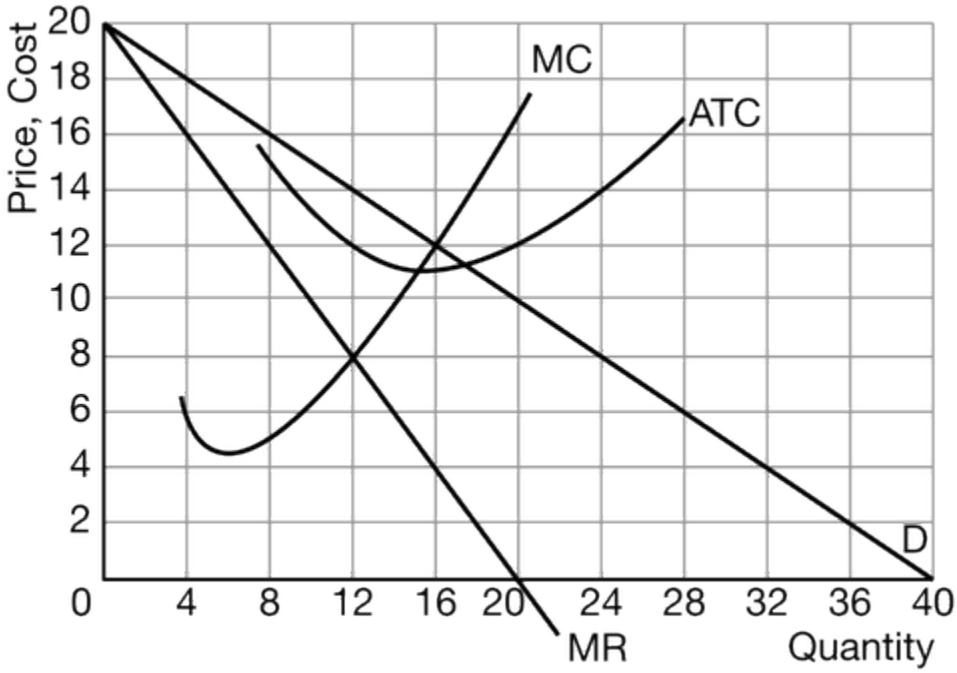
0	1 ✓

The response states that the profit-maximizing quantity will stay the same and explains that the increase in fixed cost does not affect marginal cost in the short run.

2020 Short - Set 2

Include correctly labeled diagrams, if useful or required, in explaining your answers. A correctly labeled diagram must have all axes and curves clearly labeled and must show directional changes. If the question prompts you to "Calculate," you must show how you arrived at your final answer.

Use the following graph to answer parts (a)-(e). Prices and costs are in dollars.



The graph above shows the demand (D), marginal revenue (MR), marginal cost (MC), and average total cost (ATC) curves for one of many profit-maximizing firms operating in the short run in an industry in which there are no barriers to entry. Each firm sells a similar but not identical product.

(a) Calculate the total revenue of producing 8 units. Show your work.

(b) For quantities between 8 and 12 units, is the demand curve elastic, inelastic, or unit elastic? Explain.

(c) Assume that this firm is currently charging a price of $\$14$. In order to maximize its profit, should the firm increase its price, decrease its price, or keep its price the same? Explain.

(d) At a quantity of 8 units, does this firm have increasing marginal returns or diminishing marginal returns? Explain.

(e) Identify the firm's allocatively efficient quantity, and explain how you determined it.

17. Respond to all parts of the question.

Part A

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

2020 Short - Set 2

0	1 ✓

The response calculates the total revenue of producing 8 units as $128 and shows the work.

$$\text{Total Revenue} = \text{Price} \times \text{Quantity} = \$16 \times 8 = \$128$$

Part B

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that the demand curve is elastic for quantities between 8 and 12 units and explains that the marginal revenue is positive; or uses numbers to explain that total revenue is rising as price declines in that quantity range, the percentage change in quantity demanded is greater than the percentage change in price, or the absolute value of the price elasticity of demand is greater than 1.

Part C

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that the firm should keep its price the same and explains that at a price of $14, the marginal cost is equal to the marginal revenue.

Part D

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that the firm has diminishing marginal returns and explains that marginal cost is rising at the quantity of 8 units, indicating that the marginal product is falling.

Part E

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

2020 Short - Set 2

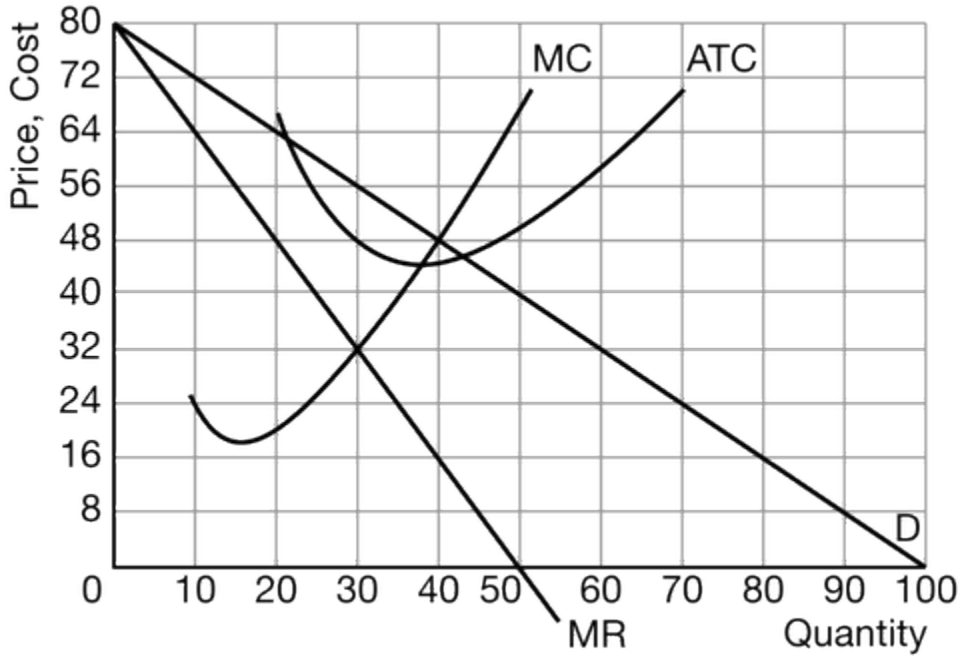
0	1 ✓

The response identifies that the allocatively efficient quantity is 16 units and explains that allocative efficiency is achieved when the marginal cost to producers equals the marginal benefit to consumers, which occurs where the demand curve intersects the marginal cost curve.

2020 Short - Set 2

Include correctly labeled diagrams, if useful or required, in explaining your answers. A correctly labeled diagram must have all axes and curves clearly labeled and must show directional changes. If the question prompts you to "Calculate," you must show how you arrived at your final answer.

Use the following graph to answer parts (a)-(e). Prices and costs are in dollars.



The graph above shows the demand (D), marginal revenue (MR), marginal cost (MC), and average total cost (ATC) curves for one of many profit-maximizing firms operating in the short run in an industry in which there are no barriers to entry. Each firm sells a similar but not identical product.

(a) Assume the firm produces 40 units. Will the firm's economic profit be positive, negative, or zero? Explain.

(b) If the firm charges $\$32$, should this firm increase its price, decrease its price, or keep the price at $\$32$ in order to maximize its total revenue? Explain.

(c) If the firm decreases its price from $\$72$ to $\$64$, does the deadweight loss increase, decrease, or remain unchanged? Explain.

(d) Identify the firm's profit-maximizing quantity and price, and explain how you determined each.

(e) Calculate the total cost of producing the profit-maximizing quantity identified in part (d). Show your work.

18. Respond to all parts of the question.

Part A

2020 Short - Set 2

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that at 40 units the firm's economic profit is positive and explains that the price is above the ATC.

Part B

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that the firm should increase its price and explains that when demand is inelastic (the portion of the demand curve where marginal revenue is less than zero), a higher price leads to more total revenue, or at $40 the firm produces the quantity where marginal revenue is zero and total revenue is maximized.

Part C

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that deadweight loss decreases and explains that the firm produces closer to the allocatively efficient quantity, where marginal cost equals price.

Part D

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response does both of the following:

· Identifies that the firm's profit-maximizing quantity is 30 units and explains that at that quantity marginal revenue is equal to marginal cost.

· Identifies that the firm's profit-maximizing price is $56 and explains that it is the price on the demand curve at the profit-maximizing quantity (where marginal revenue is equal to marginal cost).

Part E

2020 Short - Set 2

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

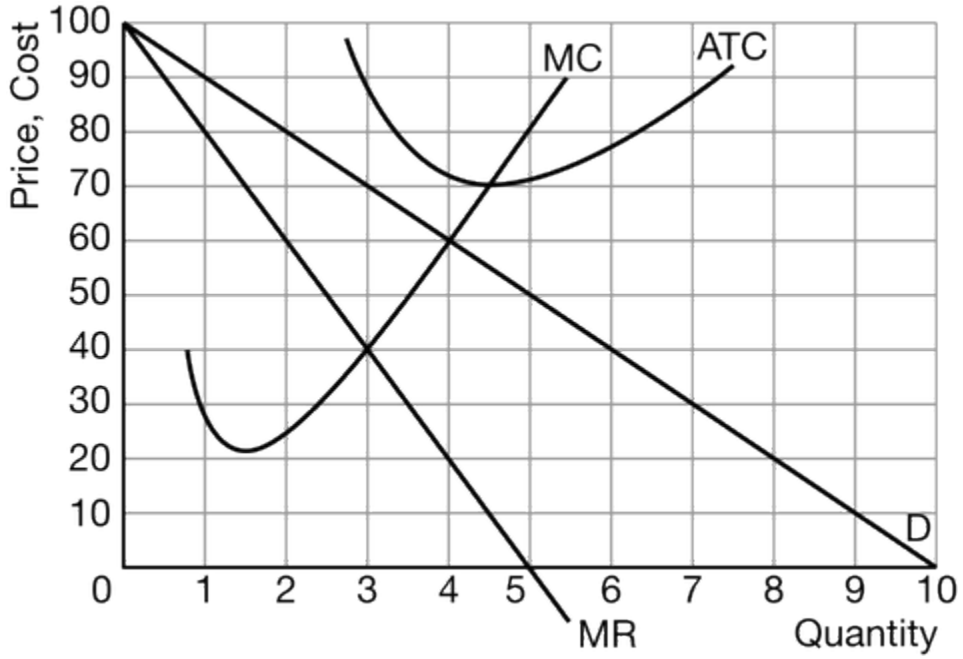
The response calculates total cost as $1,440 and shows the work.

$$\text{Total Cost} = \text{Average Total Cost} \times \text{Quantity} = \$48 \times 30 = \$1440$$

2020 Short - Set 2

Include correctly labeled diagrams, if useful or required, in explaining your answers. A correctly labeled diagram must have all axes and curves clearly labeled and must show directional changes. If the question prompts you to "Calculate," you must show how you arrived at your final answer.

Use the graph provided to answer parts (a)-(e). Prices and costs are in dollars.



The graph above shows the demand (D), marginal revenue (MR), marginal cost (MC), and average total cost (ATC) curves for one of many profit-maximizing firms operating in the short run in an industry in which there are no barriers to entry. Each firm sells a similar but not identical product.

(a) Calculate the total revenue of producing 2 units. Show your work.

(b) For quantities between 6 and 8 units, is the demand curve elastic, inelastic, or unit elastic? Explain.

(c) Assume that this firm is currently charging a price of $\$80$. In order to maximize its profit, should the firm increase its price, decrease its price, or keep its price the same? Explain.

(d) At a quantity of 1 unit, does this firm have increasing marginal returns or diminishing marginal returns? Explain.

(e) Identify the firm's allocatively efficient quantity, and explain how you determined it.

19. Respond to all parts of the question.

Part A

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

2020 Short - Set 2

0	1 ✓

The response calculates the total revenue of producing 2 units as $160 and shows the work.

$$\text{Total Revenue} = \text{Price} \times \text{Quantity} = \$80 \times 2 = \$160$$

Part B

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that the demand curve is inelastic for quantities between 6 and 8 units and explains that the marginal revenue is negative; or uses numbers to explain that total revenue is falling as price declines in that quantity range, the percentage change in quantity demanded is less than the percentage change in price, or the absolute value of the price elasticity of demand is less than 1.

Part C

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that the firm should decrease its price and explains that at a price of $80 the marginal cost is greater than the marginal revenue or explains that the profit-maximizing price is $70 (this is the price from the demand curve for the profit-maximizing quantity of 3 units where marginal cost is equal to marginal revenue).

Part D

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that the firm has increasing marginal returns and explains that marginal cost is falling at the quantity of 1 unit, indicating that the marginal product is rising.

Part E

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

2020 Short - Set 2

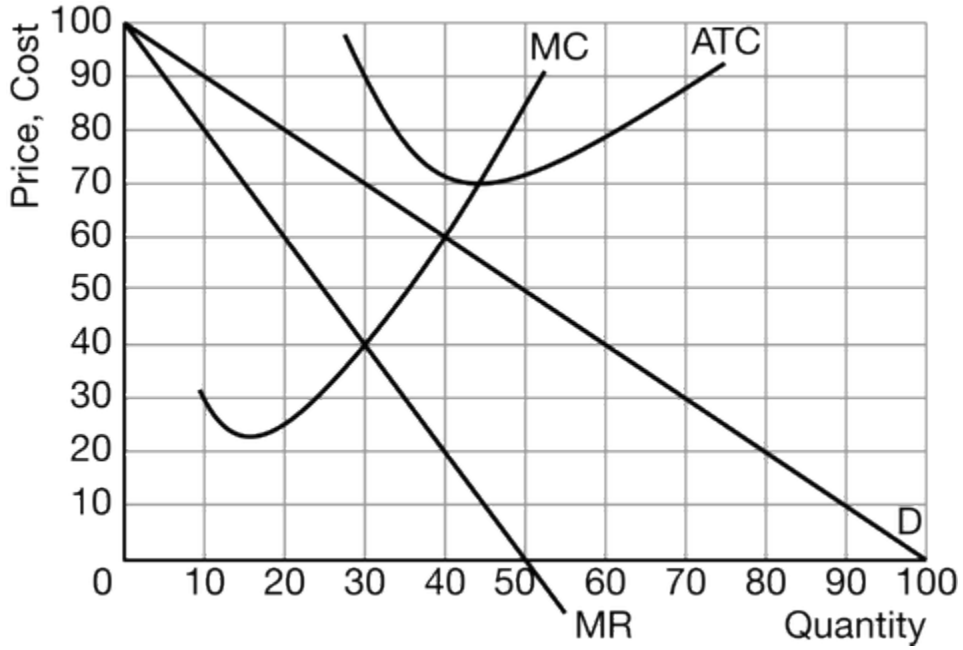
0	1 ✓

The response identifies that the allocatively efficient quantity is 4 units and explains that allocative efficiency is achieved when the marginal cost to producers equals the marginal benefit to consumers, which occurs where the demand curve intersects the marginal cost curve.

2020 Short - Set 2

Include correctly labeled diagrams, if useful or required, in explaining your answers. A correctly labeled diagram must have all axes and curves clearly labeled and must show directional changes. If the question prompts you to "Calculate," you must show how you arrived at your final answer.

Use the following graph to answer parts (a)-(e). Prices and costs are in dollars.



The graph above shows the demand (D), marginal revenue (MR), marginal cost (MC), and average total cost (ATC) curves for one of many profit-maximizing firms operating in the short run in an industry in which there are no barriers to entry. Each firm sells a similar but not identical product.

(a) For prices between $\$80$ and $\$70$, is the demand curve elastic, inelastic, or unit elastic? Explain.

(b) To produce the allocatively efficient quantity, how many units of output would the firm produce? Explain

(c) To maximize total revenue, how many units of output would the firm produce? Explain.

(d) Assuming the firm produces a quantity greater than zero, identify the firm's profit-maximizing quantity. Explain using marginal analysis.

(e) Calculate the firm's economic profit at the profit-maximizing quantity identified in part (d). Show your work.

20. Respond to all parts of the question.

Part A

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

2020 Short - Set 2

0	1 ✓

The response states that the demand curve is elastic between $80 and $70 and explains that the marginal revenue is positive; or uses numbers to explain that total revenue is rising in that price range, the percentage change in quantity is greater than the percentage change in price, or the absolute value of the price elasticity of demand is greater than 1.

Part B

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that the firm would produce 40 units of output at the allocatively efficient price and explains that at that quantity the marginal cost to producers equals the marginal benefit to consumers (where marginal cost crosses the demand curve).

Part C

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that the firm would produce 50 units of output to maximize total revenue and explains that at that quantity the marginal revenue is equal to zero, or uses numbers to explain that total revenue is maximized at that quantity of output.

Part D

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response identifies that the firm's profit-maximizing quantity is 30 units and explains that at that quantity marginal revenue is equal to marginal cost, or explains that when marginal revenue is higher than marginal cost the firm should increase production because each additional sale increases the firm's profit and when marginal cost is higher than marginal revenue the firm should decrease production because it costs more to produce the last unit than what the firm will earn from it.

Part E

2020 Short - Set 2

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response calculates the economic profit as $-\$600$ and shows the work.

$$\text{Economic Profit} = \text{Total Revenue} - \text{Total Cost} = \$70 \times 30 - \$90 \times 30 = -\$600$$

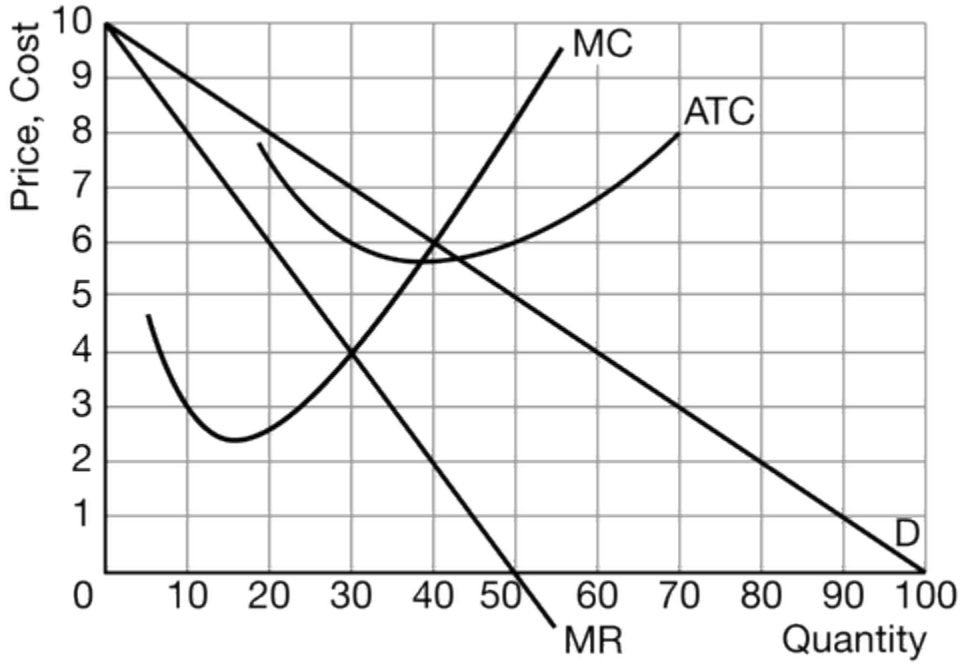
or

$$\text{Economic Profit} = (P - \text{ATC}) \times \text{Q} = (\$70 - \$90) \times 30 = -\$600$$

2020 Short - Set 2

Include correctly labeled diagrams, if useful or required, in explaining your answers. A correctly labeled diagram must have all axes and curves clearly labeled and must show directional changes. If the question prompts you to "Calculate," you must show how you arrived at your final answer.

Use the following graph to answer parts (a)-(e). Prices and costs are in dollars.



The graph above shows the demand (D), marginal revenue (MR), marginal cost (MC), and average total cost (ATC) curves for one of many profit-maximizing firms operating in the short run in an industry in which there are no barriers to entry. Each firm sells a similar but not identical product.

(a) Calculate the total revenue of producing 30 units. Show your work.

(b) For quantities between 30 and 40 units, is the demand curve elastic, inelastic, or unit elastic? Explain.

(c) Assume that this firm is currently charging a price of $\$6$. In order to maximize its profit, should the firm increase its price, decrease its price, or keep its price the same? Explain.

(d) At a quantity of 50 units, does this firm have increasing marginal returns or diminishing marginal returns? Explain.

(e) Identify the firm's allocatively efficient quantity, and explain how you determined it.

21. Respond to all parts of the question.

Part A

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

2020 Short - Set 2

0	1 ✓

The response calculates the total revenue of producing 30 units as $210 and shows the work.

$$\text{Total Revenue} = \text{Price} \times \text{Quantity} = \$7 \times 30 = \$210$$

Part B

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that the demand curve is elastic for quantities between 30 and 40 units and explains that the marginal revenue is positive; or use numbers to explain that total revenue is rising as price goes down in that quantity range, the percentage change in quantity demanded is greater than the percentage change in price, or the absolute value of the price elasticity of demand is greater than 1.

Part C

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that the firm should increase its price and explains that at a price of $6, the marginal cost is greater than the marginal revenue or explains that the profit-maximizing price is $7 (from the demand curve for the profit-maximizing quantity where marginal cost is equal to marginal revenue).

Part D

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that the firm has diminishing marginal returns and explains that marginal cost is rising at the quantity of 50 units, indicating that the marginal product is falling.

Part E

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

2020 Short - Set 2

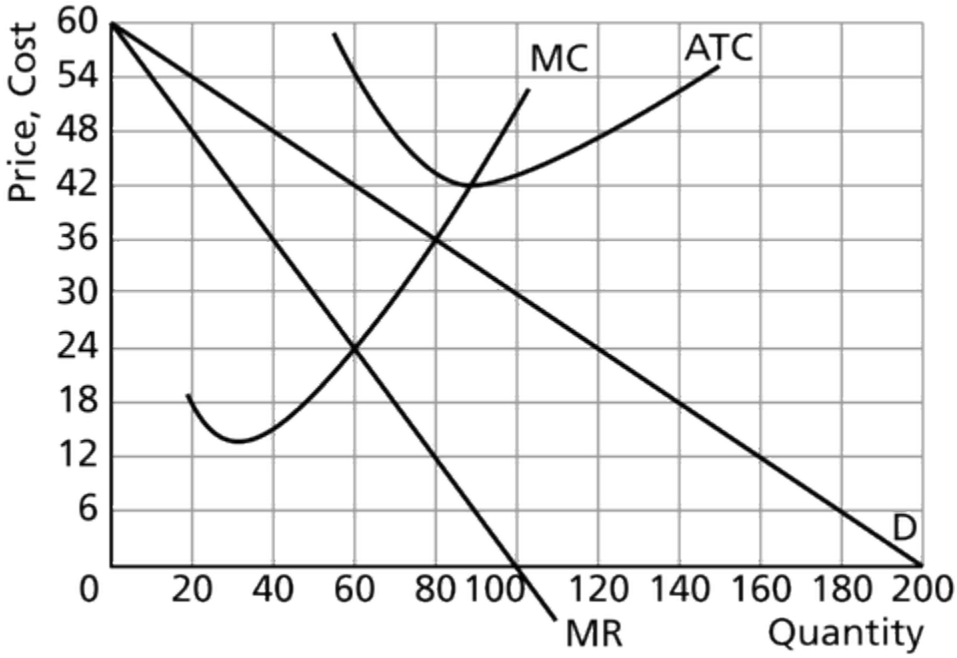
0	1 ✓

The response identifies that the allocatively efficient quantity is 40 units and explains that allocative efficiency is achieved when the marginal cost to producers equals the marginal benefit to consumers, which occurs where the demand curve intersects the marginal cost curve.

2020 Short - Set 2

Include correctly labeled diagrams, if useful or required, in explaining your answers. A correctly labeled diagram must have all axes and curves clearly labeled and must show directional changes. If the question prompts you to "Calculate," you must show how you arrived at your final answer.

Use the following graph to answer parts (a)-(e). Prices and costs are in dollars.



The graph above shows the demand (D), marginal revenue (MR), marginal cost (MC), and average total cost (ATC) curves for one of many profit-maximizing firms operating in the short run in an industry in which there are no barriers to entry. Each firm sells a similar but not identical product.

(a) At what quantity is the demand for this product unit elastic? Explain.

(b) Use the relationship between the marginal cost curve and the average total cost curve to explain why the average total cost curve is decreasing at 80 units.

(c) If the firm maximizes profit, identify the profit-maximizing quantity and price, and explain how you determined each.

(d) Calculate the deadweight loss at the profit-maximizing quantity identified in part (c). Show your work.

(e) Assume fixed cost decreases by $\$12$. Will the profit-maximizing quantity increase, decrease, or stay the same in the short run? Explain.

22. Respond to all parts of the question.

Part A

2020 Short - Set 2

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that the demand curve is unit elastic at the quantity of 100 units and explains that the marginal revenue is zero, or uses numbers to explain that total revenue is maximized at this quantity or that the absolute value of the price elasticity of demand is 1.

Part B

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response explains that at 80 units marginal cost is less than average total cost, which means that the additional cost of producing the next unit is lower than the average total cost, which pulls down the average total cost for the next unit.

Part C

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response does both of the following:

· Identifies that the firm's profit-maximizing quantity is 60 units and explains that at that quantity marginal revenue is equal to marginal cost.

· Identifies that the firm's profit-maximizing price is $42 and explains that it is the price on the demand curve at the profit-maximizing quantity (where marginal revenue is equal to marginal cost).

Part D

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response calculates the deadweight loss at the profit-maximizing quantity as $180 and shows the work.

2020 Short - Set 2

$$\text{Deadweight Loss} = \frac{1}{2}(\$42 - \$24)(80 - 60) = \$180$$

Part E

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

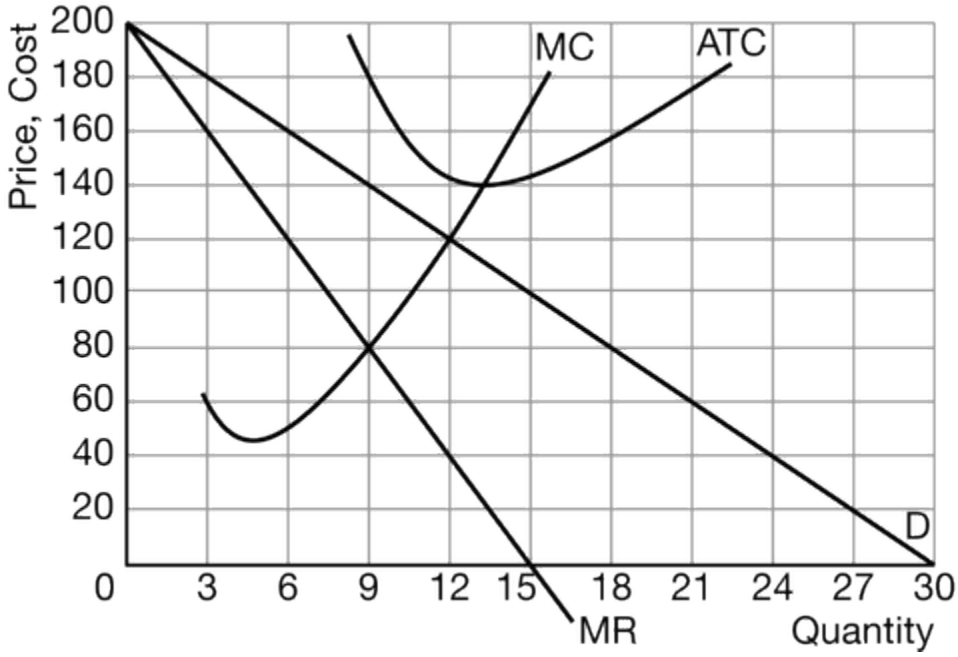
0	1 ✓

The response states that the profit-maximizing quantity will stay the same and explains that the decrease in fixed cost does not affect marginal cost in the short run.

2020 Short - Set 2

***Include correctly labeled diagrams, if useful or required, in explaining your answers. A correctly labeled diagram must have all axes and curves cle*arly labeled and must show directional changes. If the question prompts you to "Calculate," you must show how you arrived at your final answer.**

Use the following graph to answer parts (a)-(e). Prices and costs are in dollars.



The graph above shows the demand (D), marginal revenue (MR), marginal cost (MC), and average total cost (ATC) curves for one of many profit-maximizing firms operating in the short run in an industry in which there are no barriers to entry. Each firm sells a similar but not identical product.

(a) For prices between $\$140$ and $\$120$, is the demand curve elastic, inelastic, or unit elastic? Explain.

(b) To produce the allocatively efficient quantity, how many units of output would the firm produce? Explain.

(c) To maximize total revenue, how many units of output would the firm produce? Explain.

(d) Assuming the firm produces a quantity greater than zero, identify the firm's profit-maximizing quantity. Explain using marginal analysis.

(e) Calculate the firm's economic profit at the profit-maximizing quantity identified in part (d). Show your work.

23. Respond to all parts of the question.

Part A

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

2020 Short - Set 2

0	1 ✓

The response states that the demand curve is elastic between $140 and $120 and explains that the marginal revenue is positive; or uses numbers to explain that total revenue is rising in that price range, the percentage change in quantity is greater than the percentage change in price, or the absolute value of the price elasticity of demand is greater than 1.

Part B

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that the firm would produce 12 units of output at the allocatively efficient price and explains that at that quantity the marginal cost to producers equals the marginal benefit to consumers (where marginal cost crosses the demand curve).

Part C

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that the firm would produce 15 units of output to maximize total revenue and explains that at that quantity the marginal revenue is equal to zero, or uses numbers to explain that total revenue is maximized at that quantity of output.

Part D

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response identifies that the firm's profit-maximizing quantity is 9 units and explains that at that quantity marginal revenue is equal to marginal cost, or explains that when marginal revenue is higher than marginal cost the firm should increase production because each additional sale increases the firm's profit and when marginal cost is higher than marginal revenue the firm should decrease production because it costs more to produce the last unit than what the firm will earn from it.

Part E

2020 Short - Set 2

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response calculates the economic profit(loss) as $-\$360$ and shows the work.

$$\text{Economic Profit} = \text{Total Revenue} - \text{Total Cost} = \$140 \times 9 - \$180 \times 9 = -\$360$$

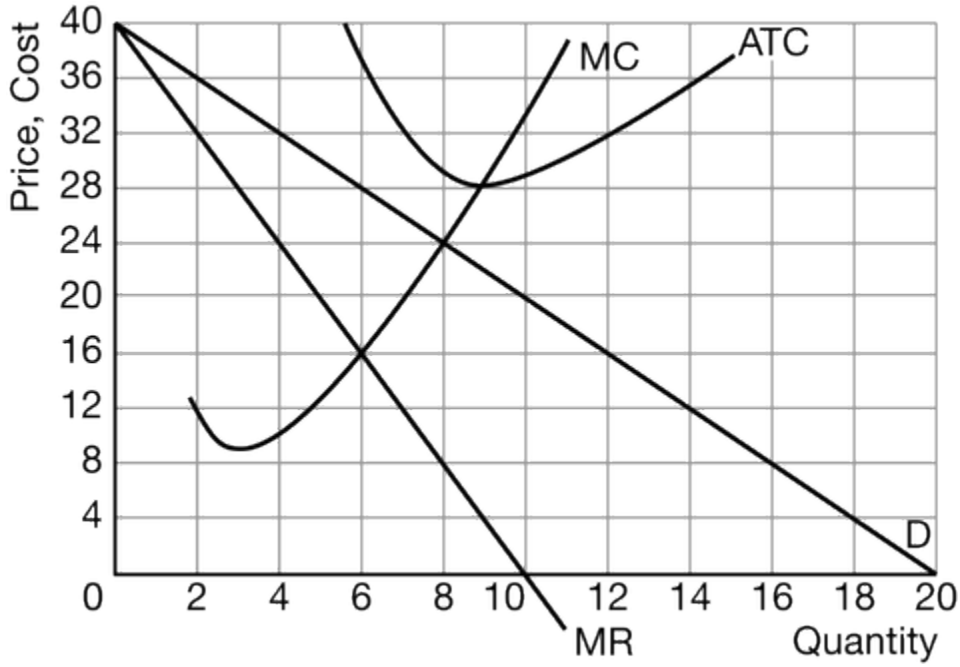
or

$$\text{Economic Profit} = (P - \text{ATC}) \times \text{Q} = (\$140 - \$180) \times 9 = \ -\$360$$

2020 Short - Set 2

Include correctly labeled diagrams, if useful or required, in explaining your answers. A correctly labeled diagram must have all axes and curves clearly labeled and must show directional changes. If the question prompts you to "Calculate," you must show how you arrived at your final answer.

Use the following graph to answer parts (a)-(e). Prices and costs are in dollars.



The graph above shows the demand (D), marginal revenue (MR), marginal cost (MC), and average total cost (ATC) curves for one of many profit-maximizing firms operating in the short run in an industry in which there are no barriers to entry. Each firm sells a similar but not identical product.

(a) What will happen to total revenue if the firm raises the price from $\$12$ to $\$16$? Explain.

(b) At 10 units, is the firm producing at the allocatively efficient quantity? Explain.

(c) If the firm produces 8 units, will the firm's economic profit be positive, negative, or zero? Explain.

(d) Use the relationship between the marginal cost curve and the average total cost curve to explain why the average total cost curve is increasing at 10 units.

(e) Calculate the consumer surplus if the firm charges the profit-maximizing price. Show your work.

24. Respond to all parts of the question.

Part A

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

2020 Short - Set 2

0	1 ✓

The response states that total revenue will increase and explains that demand is price inelastic in this price range; or uses numbers to explain that the percentage decrease in quantity demanded is less than the percentage increase in price, the absolute value of the price elasticity of demand is less than 1, or the total revenue increases.

Part B

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that no, the firm is not producing at the allocatively efficient quantity and explains that allocative efficiency is achieved when the marginal cost to producers equals the marginal benefit to consumers, which occurs where the demand curve intersects the marginal cost curve (at 8 units).

Part C

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that at 8 units the firm's economic profit is negative (economic loss) and explains that the price is below the ATC.

Part D

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response explains that at 10 units marginal cost is greater than average total cost, which means that the cost of producing the next unit is higher than the average total cost, which pulls up the average total cost for the next unit.

Part E

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

2020 Short - Set 2

0	1 ✓

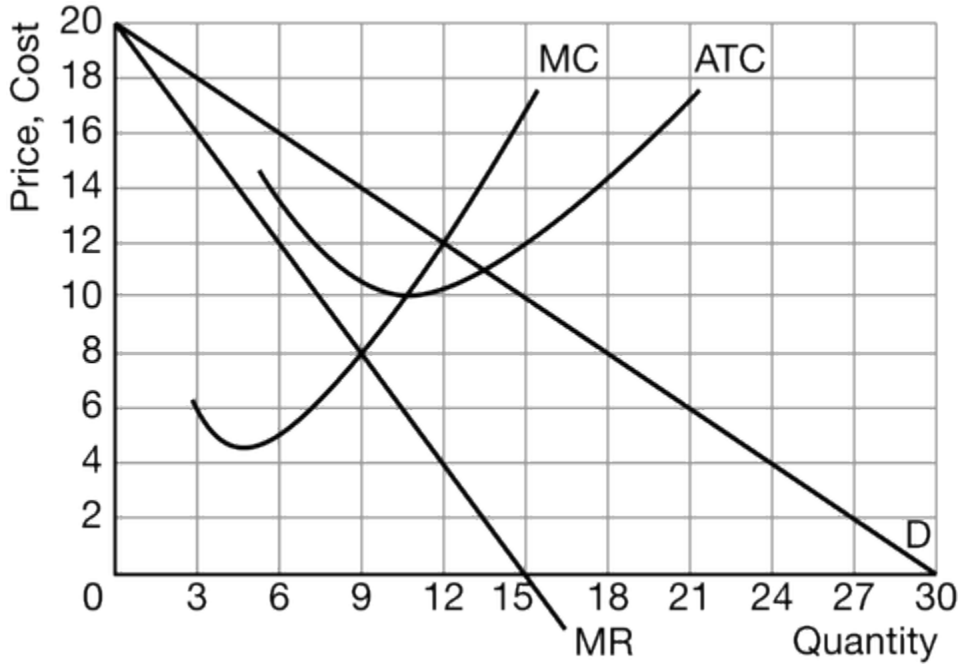
The response calculates the consumer surplus as $36 and shows the work:

$$\text{Consumer Surplus} = \frac{1}{2}(6)(\$40 - \$28) = \$36$$

2020 Short - Set 2

Include correctly labeled diagrams, if useful or required, in explaining your answers. A correctly labeled diagram must have all axes and curves clearly labeled and must show directional changes. If the question prompts you to "Calculate," you must show how you arrived at your final answer.

Use the following graph to answer parts (a)-(e). Prices and costs are in dollars.



The graph above shows the demand (D), marginal revenue (MR), marginal cost (MC), and average total cost (ATC) curves for one of many profit-maximizing firms operating in the short run in an industry in which there are no barriers to entry. Each firm sells a similar but not identical product.

(a) At what quantity is the demand for this product unit elastic? Explain.

(b) Use the relationship between the marginal cost curve and the average total cost curve to explain why the average total cost curve is increasing at 12 units.

(c) If the firm maximizes profit, identify the profit-maximizing quantity and price, and explain how you determined each.

(d) Calculate the deadweight loss at the profit-maximizing quantity identified in part (c). Show your work.

(e) Assume fixed cost increases by $\$4$. Will the profit-maximizing quantity increase, decrease, or stay the same in the short run? Explain.

25. Respond to all parts of the question.

Part A

2020 Short - Set 2

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that the demand curve is unit elastic at the quantity of 15 units and explains that the marginal revenue is zero, or uses numbers to explain that total revenue is maximized at this quantity or that the absolute value of the price elasticity of demand is 1.

Part B

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response explains that at 12 units marginal cost exceeds average total cost, which means that the additional cost of producing the next unit is higher than the average total cost, which pulls the average total cost up for the next unit.

Part C

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response does both of the following:

· Identifies that the firm's profit-maximizing quantity is 9 units and explains that at that quantity marginal revenue is equal to marginal cost.

· Identifies that the firm's profit-maximizing price is $14 and explains that it is the price on the demand curve at the profit-maximizing quantity (where marginal revenue is equal to marginal cost).

Part D

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response calculates the deadweight loss at the profit-maximizing quantity as $9 and shows the work.

2020 Short - Set 2

$$\text{Deadweight Loss} = \frac{1}{2}(\$14 - \$8)(12 - 9) = \$9$$

Part E

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

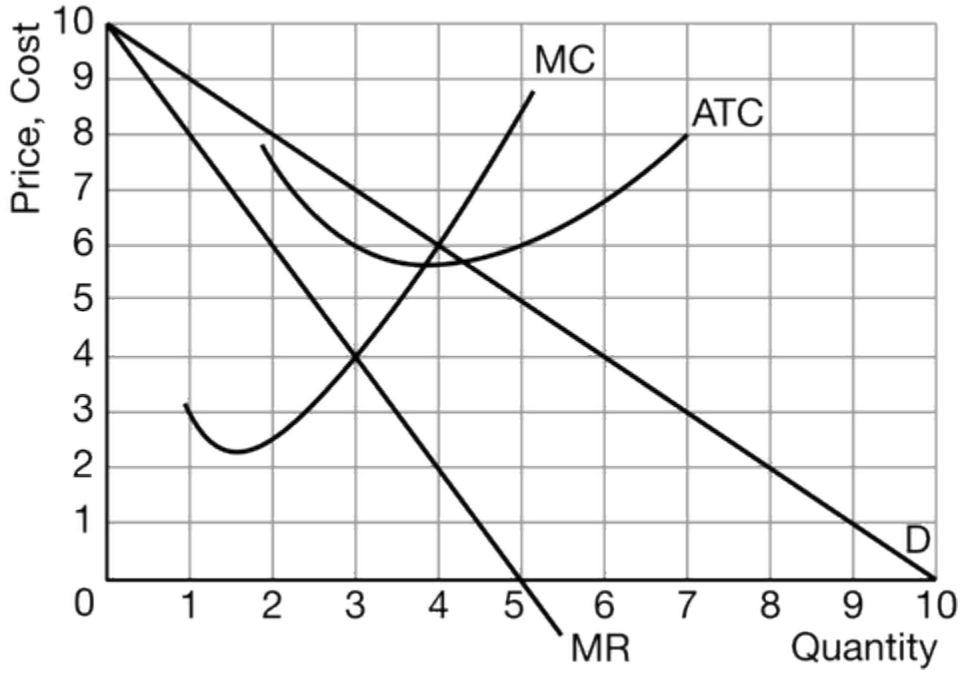
0	1 ✓

The response states that the profit-maximizing quantity will stay the same and explains that the increase in fixed cost does not affect marginal cost in the short run.

2020 Short - Set 2

Include correctly labeled diagrams, if useful or required, in explaining your answers. A correctly labeled diagram must have all axes and curves clearly labeled and must show directional changes. If the question prompts you to "Calculate," you must show how you arrived at your final answer.

Use the following graph to answer parts (a)-(e). Prices and costs are in dollars.



The graph above shows the demand (D), marginal revenue (MR), marginal cost (MC), and average total cost (ATC) curves for one of many profit-maximizing firms operating in the short run in an industry in which there are no barriers to entry. Each firm sells a similar but not identical product.

(a) For prices between $\$3$ and $\$2$, is the demand curve elastic, inelastic, or unit elastic? Explain.

(b) To produce the allocatively efficient quantity, how many units of output would the firm produce? Explain.

(c) To maximize total revenue, how many units of output would the firm produce? Explain.

(d) Identify the firm's profit-maximizing quantity. Explain using marginal analysis.

(e) Calculate the firm's economic profit at the profit-maximizing quantity identified in part (d). Show your work.

26. Respond to all parts of the question.

Part A

2020 Short - Set 2

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that the demand curve is inelastic between $3 and $2 and explains that the marginal revenue is negative; or uses numbers to explain that total revenue is falling in that price range, the percentage change in quantity is less than the percentage change in price, or the absolute value of the price elasticity of demand is less than 1.

Part B

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that the firm would produce 4 units of output at the allocatively efficient price and explains that at that quantity the marginal cost to producers equals the marginal benefit to consumers (where marginal cost crosses the demand curve).

Part C

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that the firm would produce 5 units of output to maximize total revenue and explains that at that quantity the marginal revenue is equal to zero, or uses numbers to explain that total revenue is maximized at that quantity of output.

Part D

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response identifies that the firm’s profit-maximizing quantity is 3 units and explains that at that quantity marginal revenue is equal to marginal cost, or explains that when marginal revenue is higher than marginal cost the firm should increase production because each additional sale increases the firm’s profit and when marginal cost is higher than marginal revenue the firm should decrease production because it costs more to produce the last unit than what the firm will earn from it.

2020 Short - Set 2

Part E

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response calculates the economic profit as $3 and shows the work.

$$\text{Economic Profit} = \text{ Total Revenue } - \text{ Total Cost} = \$7 \times 3 - \$6 \times 3 = \$3$$

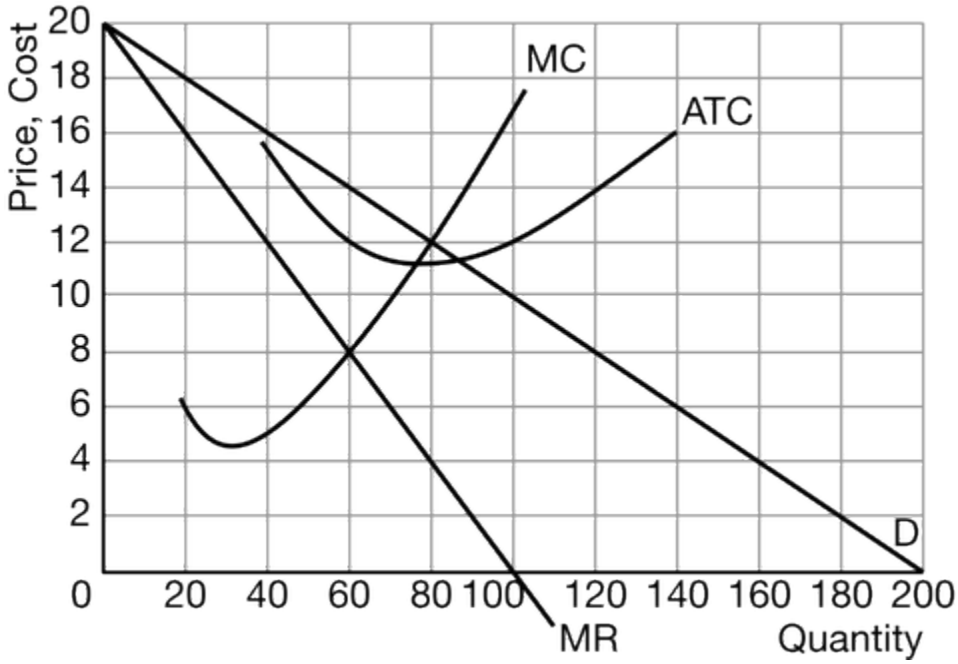
OR

$$\text{Economic Profit} = (P - \text{ATC}) \times \text{ Q} = (\$7 - \$6) \times 3 = \$3$$

2020 Short - Set 2

Include correctly labeled diagrams, if useful or required, in explaining your answers. A correctly labeled diagram must have all axes and curves clearly labeled and must show directional changes. If the question prompts you to "Calculate," you must show how you arrived at your final answer.

Use the following graph to answer parts (a)-(e). Prices and costs are in dollars.



The graph above shows the demand (D), marginal revenue (MR), marginal cost (MC), and average total cost (ATC) curves for one of many profit-maximizing firms operating in the short run in an industry in which there are no barriers to entry. Each firm sells a similar but not identical product.

(a) For prices between $\$8$ and $\$6$, is the demand curve elastic, inelastic, or unit elastic? Explain.

(b) To produce the allocatively efficient quantity, how many units of output would the firm produce? Explain.

(c) To maximize total revenue, how many units of output would the firm produce? Explain.

(d) Identify the firm's profit-maximizing quantity. Explain using marginal analysis.

(e) Calculate the firm's economic profit at the profit-maximizing quantity identified in part (d). Show your work.

27. Respond to all parts of the question.

Part A

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

2020 Short - Set 2

0	1 ✓

The response states that the demand curve is inelastic between $8 and $6 and explains that the marginal revenue is negative; or uses numbers to explain that total revenue is falling in that price range, the percentage change in quantity is less than the percentage change in price, or the absolute value of the price elasticity of demand is less than 1.

Part B

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that the firm would produce 80 units of output at the allocatively efficient price and explains that at that quantity the marginal cost to producers equals the marginal benefit to consumers (where marginal cost crosses the demand curve).

Part C

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that the firm would produce 100 units of output to maximize total revenue and explains that at that quantity the marginal revenue is equal to zero, or uses numbers to explain that total revenue is maximized at that quantity of output.

Part D

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response identifies that the firm’s profit-maximizing quantity is 60 units and explains that at that quantity marginal revenue is equal to marginal cost, or explains that when marginal revenue is higher than marginal cost the firm should increase production because each additional sale increases the firm’s profit and when marginal cost is higher than marginal revenue the firm should decrease production because it costs more to produce the last unit than what the firm will earn from it.

Part E

2020 Short - Set 2

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response calculates the economic profit as $120 and shows the work.

$$\text{Economic Profit} = \text{Total Revenue} - \text{Total Cost} = \$14 \times 60 = -\$12 \times 60 = \$120$$

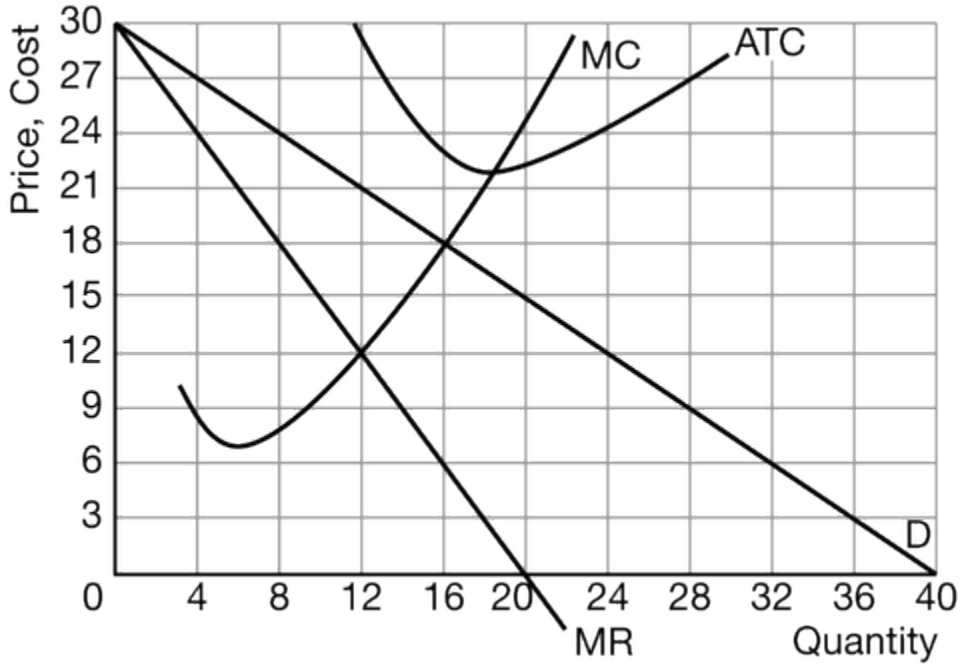
or

$$\text{Economic Profit} = (P - \text{ATC}) \times \text{Q} = (\$14 - \$12) \times 60 = \$120$$

2020 Short - Set 2

Include correctly labeled diagrams, if useful or required, in explaining your answers. A correctly labeled diagram must have all axes and curves clearly labeled and must show directional changes. If the question prompts you to "Calculate," you must show how you arrived at your final answer.

Use the following graph to answer parts (a)-(e). Prices and costs are in dollars.



The graph above shows the demand (D), marginal revenue (MR), marginal cost (MC), and average total cost (ATC) curves for one of many profit-maximizing firms operating in the short run in an industry in which there are no barriers to entry. Each firm sells a similar but not identical product.

(a) What will happen to total revenue if the firm raises the price from $\$9$ to $\$12$? Explain.

(b) At 16 units, is the firm producing at the allocatively efficient quantity? Explain.

(c) If the firm produces 12 units, will the firm's economic profit be positive, negative, or zero? Explain.

(d) Use the relationship between the marginal cost curve and the average total cost curve to explain why the average total cost curve is increasing at 20 units.

(e) Calculate the consumer surplus if the firm charges the profit-maximizing price. Show your work.

28. Respond to all parts of the question.

Part A

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

2020 Short - Set 2

0	1 ✓

The response states that total revenue will increase and explains that demand is price inelastic in this price range; or uses numbers to explain that the percentage decrease in quantity demanded is less than the percentage increase in price, the absolute value of the price elasticity of demand is less than 1, or the total revenue increases.

Part B

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that yes, the firm is producing at the allocatively efficient quantity and explains that allocative efficiency is achieved when the marginal cost to producers equals the marginal benefit to consumers, which occurs where the demand curve intersects the marginal cost curve (at 16 units).

Part C

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that at 12 units the firm's economic profit is negative (or there is an economic loss) and explains that the price is below the ATC.

Part D

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response explains that at 20 units marginal cost is greater than average total cost, which means that the cost of producing the next unit is higher than the average total cost, which pulls up the average total cost for the next unit.

Part E

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

2020 Short - Set 2

0	1 ✓

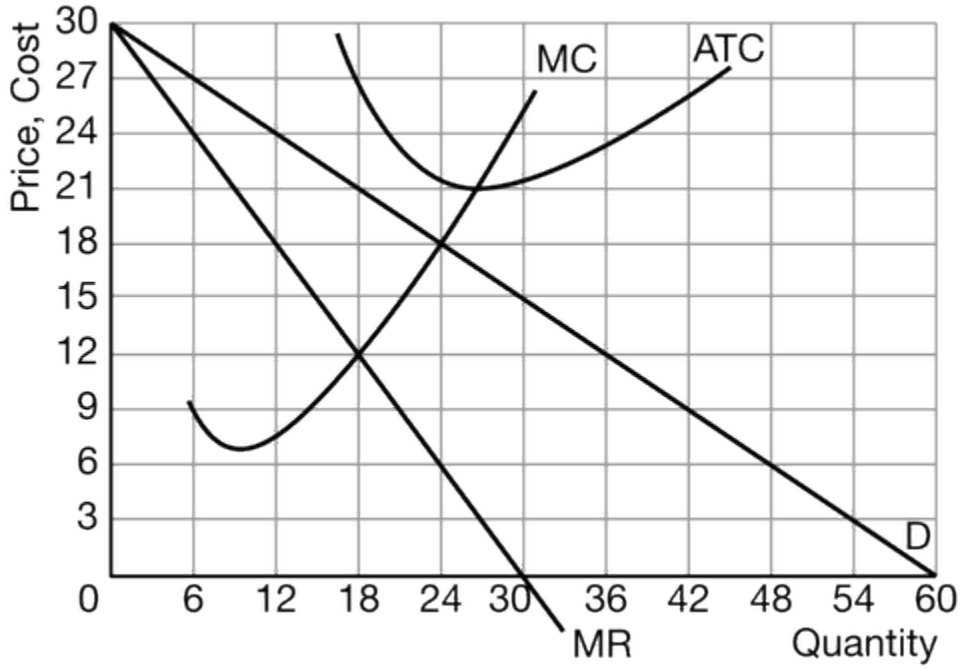
The response calculates the consumer surplus as $54 and shows the work:

$$\text{Consumer Surplus} = \frac{1}{2}(12)(\$30 - \$21) = \$54$$

2020 Short - Set 2

Include correctly labeled diagrams, if useful or required, in explaining your answers. A correctly labeled diagram must have all axes and curves clearly labeled and must show directional changes. If the question prompts you to "Calculate," you must show how you arrived at your final answer.

Use the following graph to answer parts (a)-(e). Prices and costs are in dollars.



The graph above shows the demand (D), marginal revenue (MR), marginal cost (MC), and average total cost (ATC) curves for one of many profit-maximizing firms operating in the short run in an industry in which there are no barriers to entry. Each firm sells a similar but not identical product.

(a) At what quantity is the demand for this product unit elastic? Explain.

(b Use the relationship between the marginal cost curve and the average total cost curve to explain why the average total cost curve is decreasing at 18 units.

(c) If the firm maximizes profit, identify the profit-maximizing quantity and price, and explain how you determined each.

(d) Calculate the deadweight loss at the profit-maximizing quantity identified in part (c). Show your work.

(e) Assume fixed cost decreases by $\$9$. Will the profit-maximizing quantity increase, decrease, or stay the same in the short run? Explain.

29. Respond to all parts of the question.

Part A

2020 Short - Set 2

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that the demand curve is unit elastic at the quantity of 30 units and explains that the marginal revenue is zero, or uses numbers to explain that total revenue is maximized at this quantity or that the absolute value of the price elasticity of demand is 1.

Part B

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response explains that at 18 units marginal cost is less than average total cost, which means that the additional cost of producing the next unit is lower than the average total cost, which pulls down the average total cost for the next unit.

Part C

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response does both of the following:

· Identifies that the firm's profit-maximizing quantity is 18 units and explains that at that quantity marginal revenue is equal to marginal cost.

· Identifies that the firm's profit-maximizing price is $21 and explains that it is the price on the demand curve at the profit-maximizing quantity (where marginal revenue is equal to marginal cost).

Part D

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response calculates the deadweight loss at the profit-maximizing quantity as $27 and shows the work.

2020 Short - Set 2

$$\text{Deadweight Loss} = \frac{1}{2}(\$21 - \$12)(24 - 18) = \$27$$

Part E

Select a point value to view scoring criteria, solutions, and/or examples and to score the response.

0	1 ✓

The response states that the profit-maximizing quantity will stay the same and explains that the decrease in fixed cost does not affect marginal cost in the short run.