

Question 2: Short**5 points**

(a) State that the market equilibrium price is \$15, and the market equilibrium quantity is 300 units. **1 point**

(b) Calculate the deadweight loss as \$500 and show your work. **1 point**

$$\text{Deadweight loss} = \frac{1}{2} \times (\$25 - \$15) \times (400 - 300) = \frac{1}{2} \times \$10 \times 100 = \$500$$

(c) (i) State that the government will grant a per-unit subsidy to consumers to achieve the socially optimal quantity of Good X and explain with **ONE** of the following: **1 point**

- A per-unit subsidy to consumers that internalizes external benefits increases the incentive and ability of consumers to buy the socially optimal quantity (400).
- A per-unit subsidy to consumers equal to the marginal external benefit increases consumption to the socially optimal quantity (400), by lowering the price paid by the consumer.
- A per-unit subsidy to consumers equal to the difference between marginal social benefit and marginal private benefit increases the quantity exchanged to the socially optimal quantity (400).

(ii) State that the dollar value of the per-unit subsidy is \$10. **1 point**

Total for part (c) 2 points

(d) State no, the price ceiling will not achieve the socially optimal quantity of Good X and explain that the price ceiling will cause the quantity exchanged in the market, which is limited by the quantity supplied (200), to be less than the socially optimal quantity (400). **1 point**

Total for question 2 5 points

Question 2: Short**5 points**

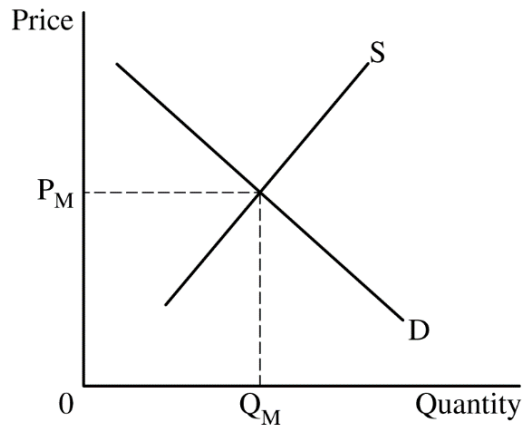
- | | | |
|--------|---|---------|
| (a) | State that Southland has a comparative advantage in producing wheat and explain that the opportunity cost of producing one bushel of wheat in Southland is 1/2 yard of cloth, which is less than the opportunity cost of producing one bushel of wheat in Northland, which is 3 yards of cloth. | 1 point |
| (b) | Identify any specific number between 5 and 30 yards of cloth. | 1 point |
| (c) | State no and explain that Southland's opportunity cost to produce one yard of cloth is 1.5 bushels of wheat, which is greater than Northland's opportunity cost of producing cloth, which is 1/3 of a bushel of wheat. | 1 point |
| (d)(i) | State no, the market results in an inefficient allocation of resources and explain with ONE of the following: <ul style="list-style-type: none"> The negative externality causes the marginal social cost to be greater than the marginal social benefit ($MSC > MSB$) at the market equilibrium. The negative externality in production causes the marginal social cost to be greater than the marginal private cost ($MSC > MPC$) at the market equilibrium. | 1 point |
| (ii) | State that a lump-sum tax will not change the market equilibrium price and quantity in the short run. | 1 point |

Total for part (d)	2 points
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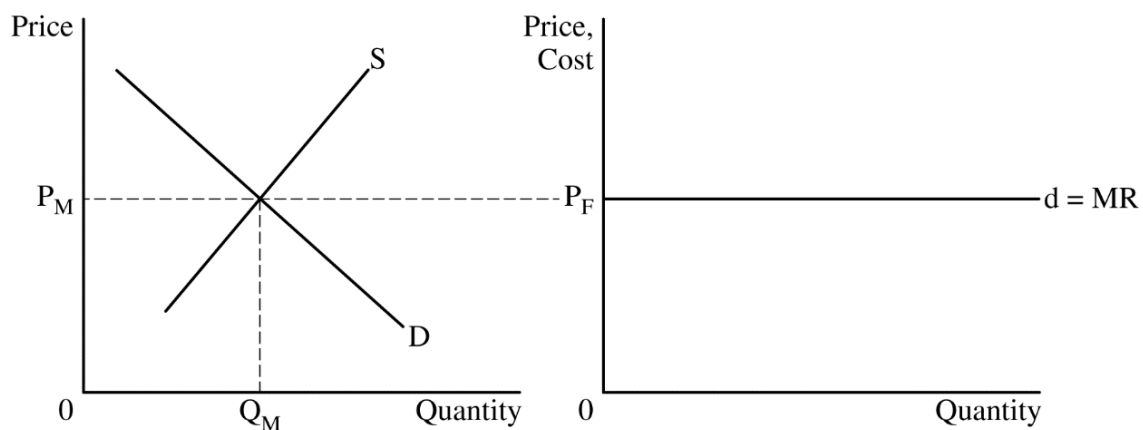
Total for question 2	5 points
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Question 1: Long**10 points**

- (a) State that Anderson Company's accounting profit must be greater than its economic profit. **1 point**
- (b) Draw a correctly labeled graph of the market for Good G with a downward-sloping demand (D) curve and upward-sloping supply (S) curve and label the market equilibrium price as P_M and the market equilibrium quantity as Q_M . **1 point**

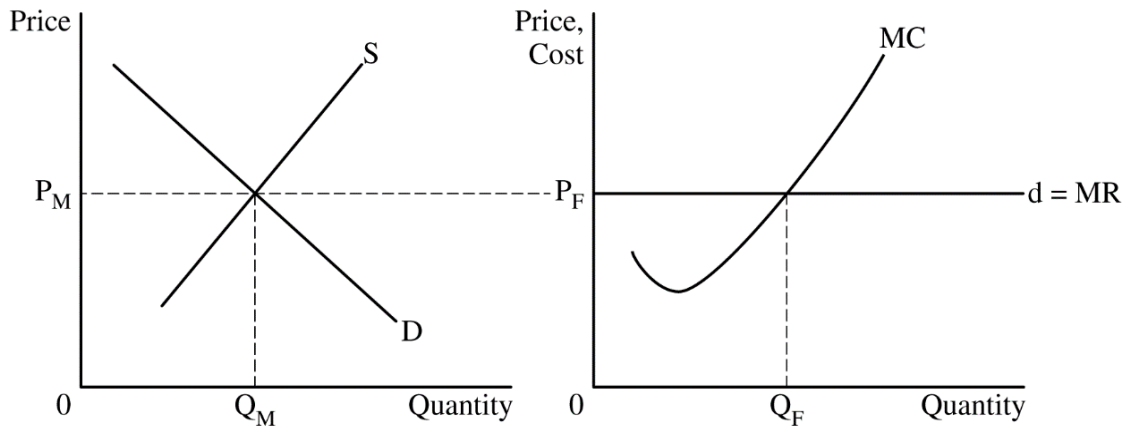


For the second point, draw a correctly labeled graph for the firm and show the firm's horizontal demand and marginal revenue ($d=MR$) curve extended from the market equilibrium price (P_M), and label the firm's price as P_F .

1 point

For the third point, the firm's graph must show a rising marginal cost (MC) curve and the profit-maximizing quantity, labeled Q_F where $MR = MC$.

1 point



For the fourth point, the firm's graph must show the average total cost (ATC) curve below the firm's demand curve at Q_F and show the MC curve passing through the minimum point of the ATC curve.

The figure consists of two side-by-side graphs. The left graph is identical to the one in the third point. The right graph has 'Price, Cost' on the vertical axis and 'Quantity' on the horizontal axis. It shows a U-shaped marginal cost curve 'MC', a U-shaped average total cost curve 'ATC' that is below the 'MC' curve, and a horizontal demand and marginal revenue curve 'd = MR'. The MC curve intersects the ATC curve at its minimum point, which corresponds to quantity Q_F . The MC curve also intersects the 'd = MR' line at quantity Q_F and price P_F . Dashed lines connect the equilibrium points to their respective values on the axes.

For the fifth point, the firm's graph must show the area representing positive economic profit, shaded completely.

1 point

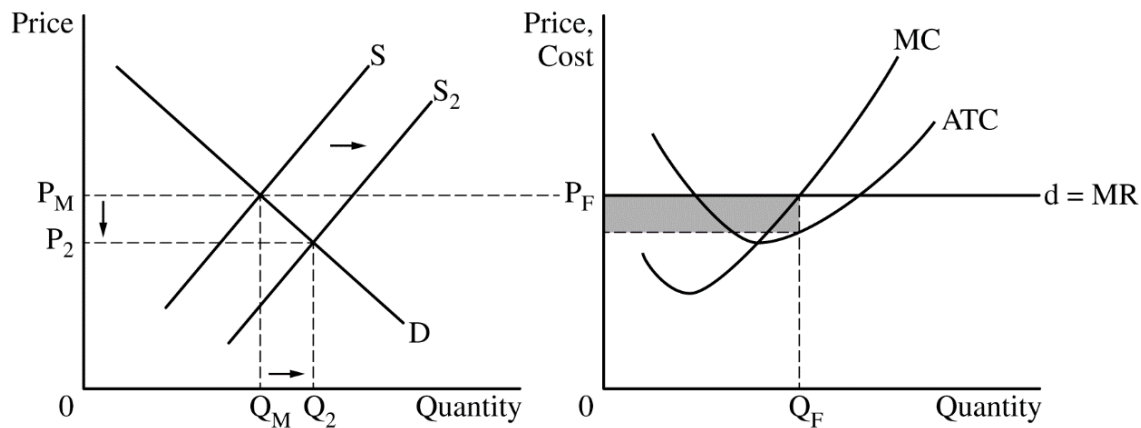
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Total for part (b) 5 points

4

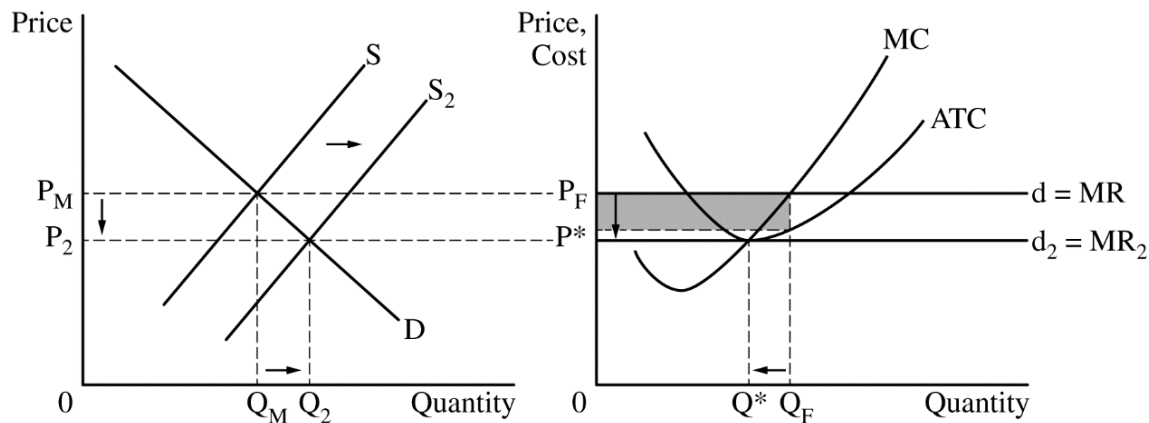
- (c)(i) On the market graph from part (a), show a rightward shift in the market supply curve, resulting in a lower market equilibrium price, labeled P_2 , and a greater market equilibrium quantity, labeled Q_2 .

1 point



- (ii) On the firm's graph from part (a), show a lower price, labeled P^* , extended from the new market equilibrium price, P_2 , and show a lower quantity produced, Q^* , at the new intersection point of $P^* = MR_2 = MC = \text{minimum ATC}$.

1 point



Total for part (c) 2 points

- (d)(i) State that the market equilibrium quantity will be less than the allocatively efficient quantity and explain that the positive externality in production causes the marginal social cost to be less than the marginal private cost ($MSC < MPC$) at the market equilibrium.

1 point

- (ii) State that total economic surplus will increase and explain with **ONE** of the following:

1 point

- The quantity produced will increase to the allocatively efficient quantity.
- Deadweight loss will decrease to \$0.
- The marginal private cost will equal the marginal social cost, causing the externality to be internalized.

Total for part (d) 2 points

Total for question 1 10 points

Question 2: Short**5 points**

(a)	State that there is a positive consumption externality.	1 point
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(b)	State that the marginal external benefit is \$3.	1 point
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(c) (i)	State that the change in profit per hour for Bueno is \$10 and show your work.	1 point
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Change in Profit per Hour

$$= \text{Marginal Revenue Product (MRP)} - \text{Marginal Factor Cost (MFC)}$$

$$= (\$5 \times 6) - \$20 = \$30 - \$20 = \$10$$

(ii)	State that Bueno's MRP curve would shift up (or to the right) and explain that the subsidy would increase the demand for guava and increase the price paid by buyers, which would increase MRP for each worker and shift the curve to the right.	1 point
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Total for part (c)		2 points
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(d)	State that the number of workers hired will decrease as the quantity of labor hired will occur at a lower quantity of labor where $MFC = MRP$ and explain with ONE of the following:	1 point
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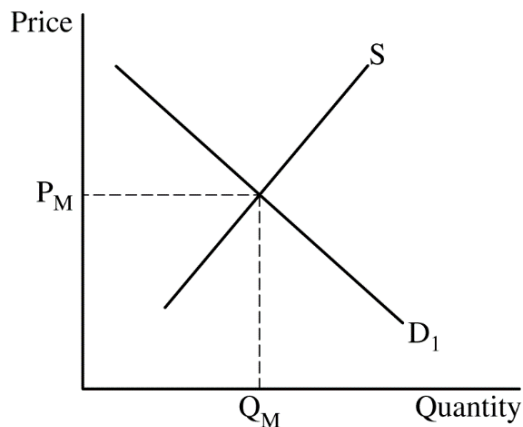
- The MFC for a monopsony is greater than the MFC for a perfectly competitive labor market.
- The MFC increases as the monopsony pays higher wages for every worker as it hires more workers whereas the MFC (or wage) is constant for a firm in a perfectly competitive labor market.

Total for question 2		5 points
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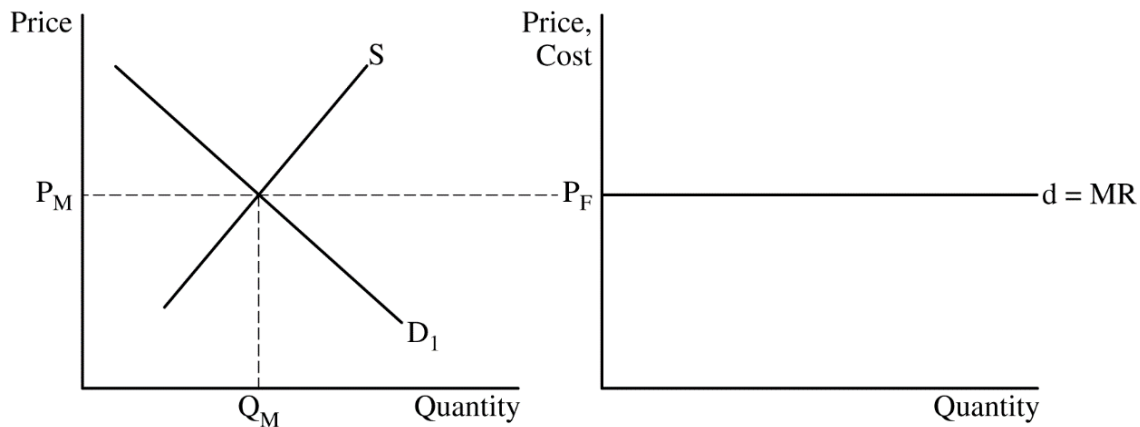
Question 1: Long

10 points

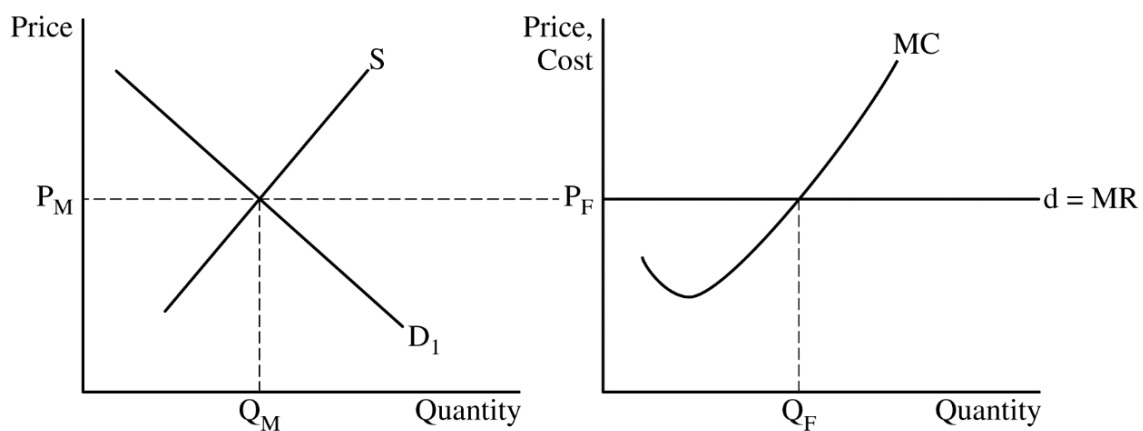
- (a) Draw a correctly labeled graph of the market for sugar and show the equilibrium price and quantity, labeled P_M and Q_M , respectively. **1 point**



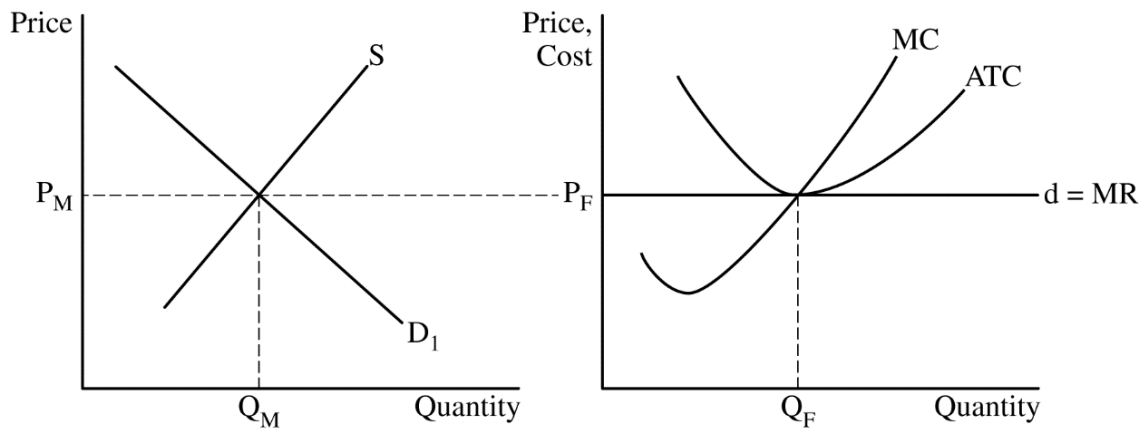
- For the second point, the graph must show a horizontal demand curve ($d = MR$) for Frank Sugar Co. and label the firm's profit-maximizing price P_F at P_M . **1 point**



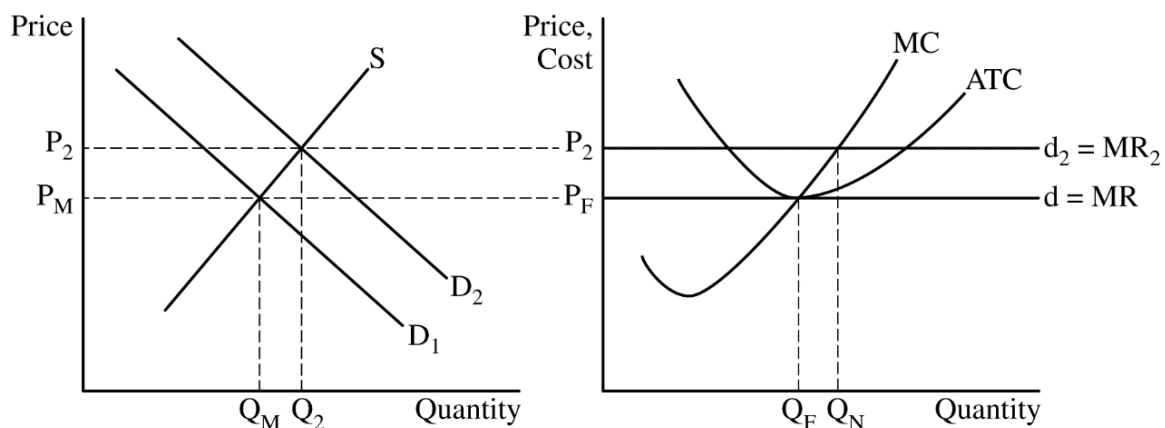
- For the third point, the firm's graph must show the marginal cost (MC) curve and show the profit-maximizing quantity, labeled Q_F where $MR = MC$. **1 point**



For the fourth point, the firm's graph must show the average total cost (ATC) curve tangent to the firm's demand curve at Q_F and show the MC curve passing through the minimum point of the ATC curve.

1 point**Total for part (a) 4 points**

- (b) On your market graph from part (a), show a rightward shift in the market demand curve with a higher market price, labeled P_2 , and show an upward shift in the firm's demand curve with a greater quantity sold by Frank Sugar Co., labeled Q_N .

1 point

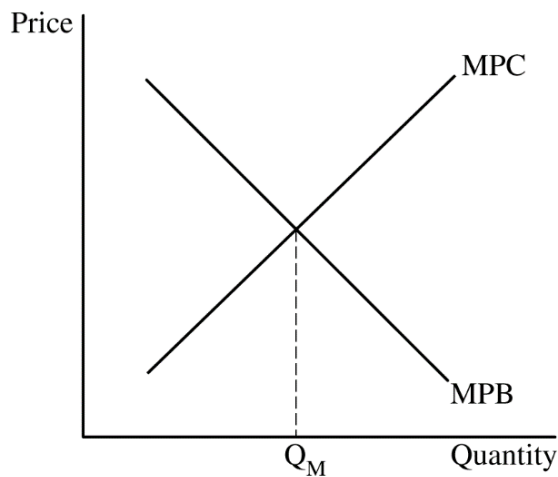
State that the profit earned by Frank Sugar Co. will increase in the short run.

1 point

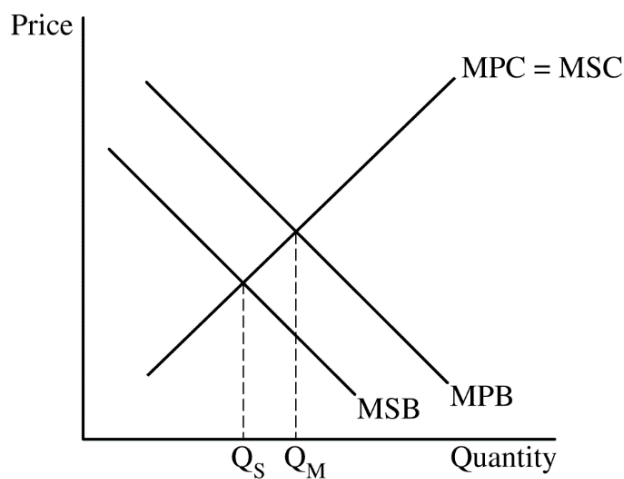
State that the market price in long-run equilibrium will be lower than P_2 and explain that new firms will enter the market, which increases the market supply, lowering the market price back to P_M where firms earn zero economic profit in the long run.

1 point**Total for part (b) 3 points**

- (c) Draw a correctly labeled graph with an upward-sloping supply curve, labeled MPC, a downward-sloping demand curve, labeled MPB, and show the market equilibrium quantity, labeled Q_M at the intersection of the MPB and MPC curves. **1 point**



- For the second point, the graph must show a downward-sloping marginal social benefit (MSB) curve below the MPB curve, label the upward sloping curve $MPC = MSC$, and show the socially optimal quantity, labeled Q_S , at the intersection of the MSB and MSC curves. **1 point**



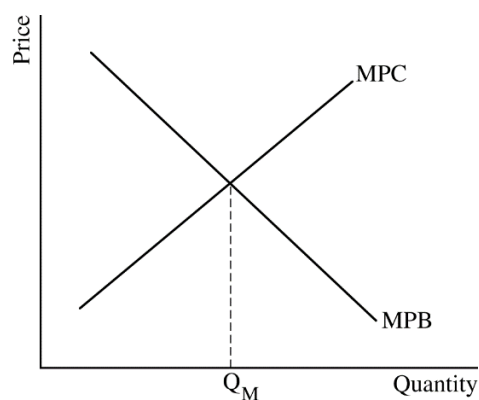
Total for part (c) 2 points

- (d) State that the government would impose a per-unit tax and explain that the tax would raise the price paid per unit **AND** decrease market equilibrium quantity to move it closer to the socially optimal quantity. **1 point**

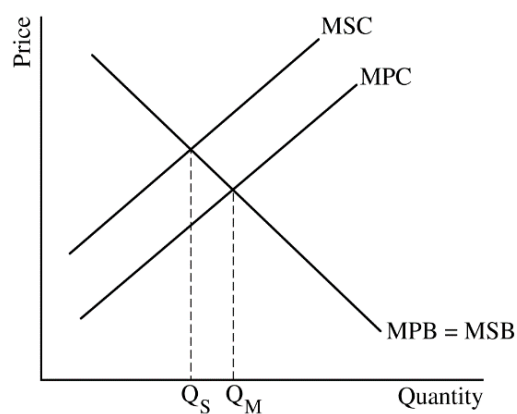
Total for question 1 10 points

Question 2: Short**5 points**

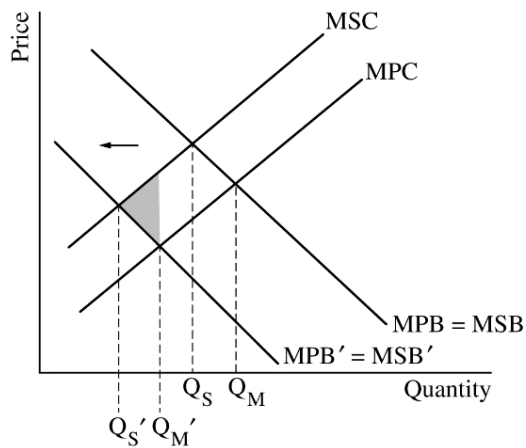
- (a) Draw a correctly labeled graph with an upward-sloping supply curve labeled MPC, a downward-sloping demand curve labeled MPB, and the market equilibrium quantity labeled Q_M . **1 point**



- For the second point, the graph must include the MSC curve above the MPC curve at all output levels and must show the socially efficient quantity labeled Q_S . **1 point**

**Total for part (a) 2 points**

- (b) On your graph from part (a), show a leftward shift of the demand curve and shade completely the area of deadweight loss at the new market equilibrium. **1 point**



- (c) (i) State that the per-unit tax would be equal to the marginal external cost ($MSC - MPC$). **1 point**
- (ii) Explain that the lump-sum tax will not change the quantity produced because it does not affect the marginal cost. **1 point**

Total for part (c) 2 points

Total for question 2 5 points

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AP Microeconomics

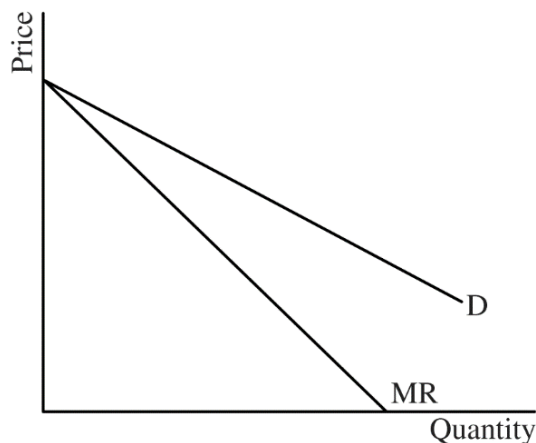
Scoring Guidelines

2018 SCORING GUIDELINES

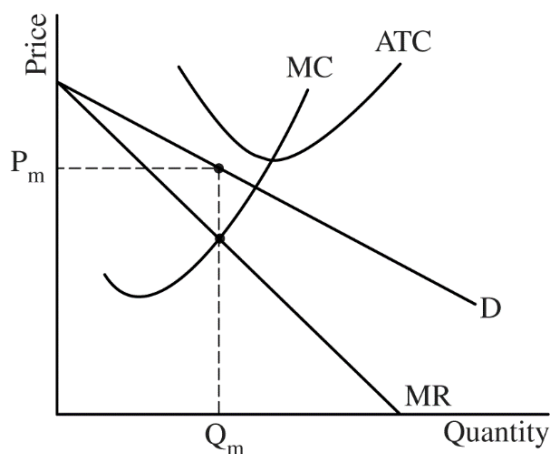
Question 1

9 points (5 + 1 + 1 + 2)

(a) 5 points:



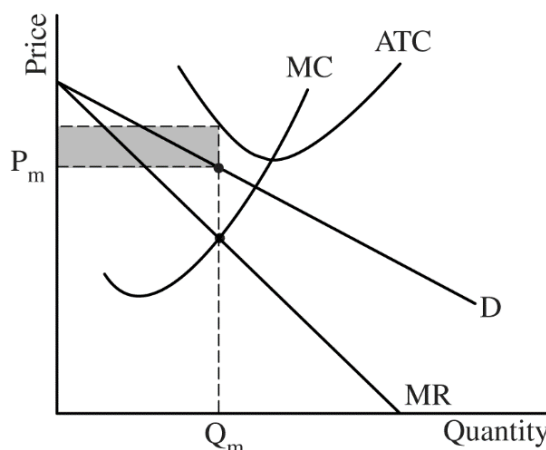
- One point is earned for drawing a correctly labeled graph for a monopoly showing a downward sloping demand (D) curve with the marginal revenue (MR) curve below the demand curve.



- One point is earned for showing the marginal cost (MC) curve rising and passing through the minimum of the average total cost (ATC) curve.
- One point is earned for showing the profit-maximizing quantity, Q_m , where $MR = MC$.
- One point is earned for showing the price, P_m , from the demand curve at Q_m .

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Question 1 (continued)



- One point is earned for completely shading the area representing negative economic profit and showing the ATC curve above the demand curve for all quantities.

(b) 1 point:

- One point is earned for stating that the price must be greater than average variable cost, OR total revenue must be greater than total variable cost, OR the firm's current economic loss is less than its fixed cost, which is equal to the firm's loss if it shuts down.

(c) 1 point:

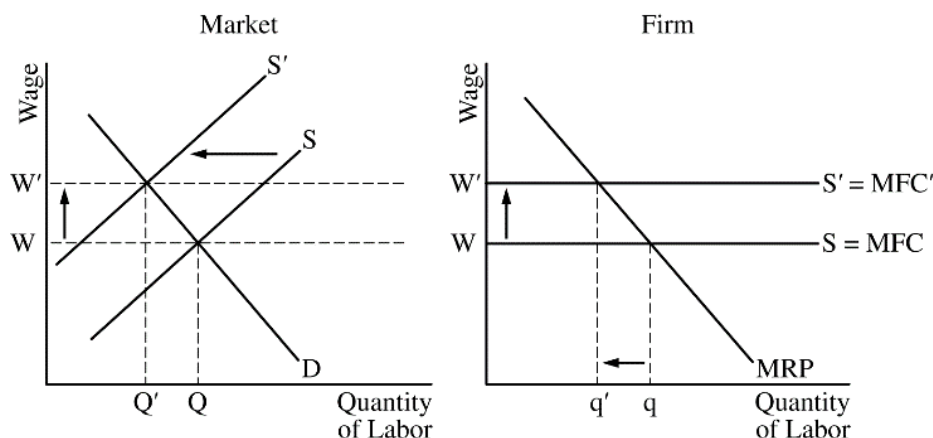
- One point is earned for stating that total revenue will decrease and explaining with one of the following reasons.
 - The monopolist is operating on the elastic portion of the demand curve.
 - The quantity effect is greater than the price effect.
 - The percentage change in quantity demanded is greater than the percentage change in price.
 - MR is positive.

(d) 2 points:

- One point is earned for stating or graphically showing that the wage rate will increase because the market supply of labor decreases (shifts left).
- One point is earned for stating the marginal revenue product (MRP) of the last worker hired will increase and explaining with one of the following reasons.
 - The firm is hiring fewer workers now and therefore the marginal product of the last worker hired increases (diminishing marginal product).
 - The market wage (marginal factor cost or MFC) increased and the profit-maximizing firm will hire where $MRP = MFC$.
 - There is an upward movement along the firm's MRP curve as wage or MFC increases (shifts up).

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Question 1 (continued)



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Question 2

6 points (1 + 1 + 1 + 1 + 2)

(a) 1 point:

- One point is earned for stating positive externality, and for explaining that either marginal social benefit is greater than marginal private benefit ($MSB > MPB$) or the equilibrium quantity is less than the socially optimal quantity.

(b) 1 point:

- One point is earned for identifying the market equilibrium price as \$6 and the market equilibrium quantity as 16 units.

(c) 1 point:

- One point is earned for identifying the area of the deadweight loss as DEF.

(d) 1 point:

- One point is earned for identifying \$4 as the dollar value of the per-unit subsidy.

(e) 2 points:

- One point is earned for identifying 8 units.
- One point is earned for stating no and explaining with one of the following reasons:
 - The quantity exchanged in the market will be less than the socially optimal quantity.
 - $MSB > MSC$ at a quantity of 8 units.
 - Deadweight loss increased after the price floor.

2018 SCORING GUIDELINES

Question 3

5 Points (1 + 1 + 1 + 1 + 1)

(a) 1 point:

- One point is earned for correctly calculating the gain, 20 points.

(b) 1 point:

- One point is earned for correctly calculating the opportunity cost, 6 points for that hour (or 6/20).

(c) 1 point:

- One point is earned for stating that the opportunity cost increases and for using one the following explanations:
 - The expected score on microeconomics decreases at an increasing rate with each additional hour spent studying history.
 - The marginal cost is rising (expected score on microeconomics decreases) for each additional hour spent studying history.

(d) 1 point:

- One point is earned for stating that Nirali should spend 2 hours on studying microeconomics and 3 hours on studying history to maximize the sum of expected scores.

(e) 1 point:

- One point is earned for stating that Nirali will spend the additional hour studying microeconomics because studying microeconomics will increase her expected total score by 8 points compared to 5 points if spent studying history.

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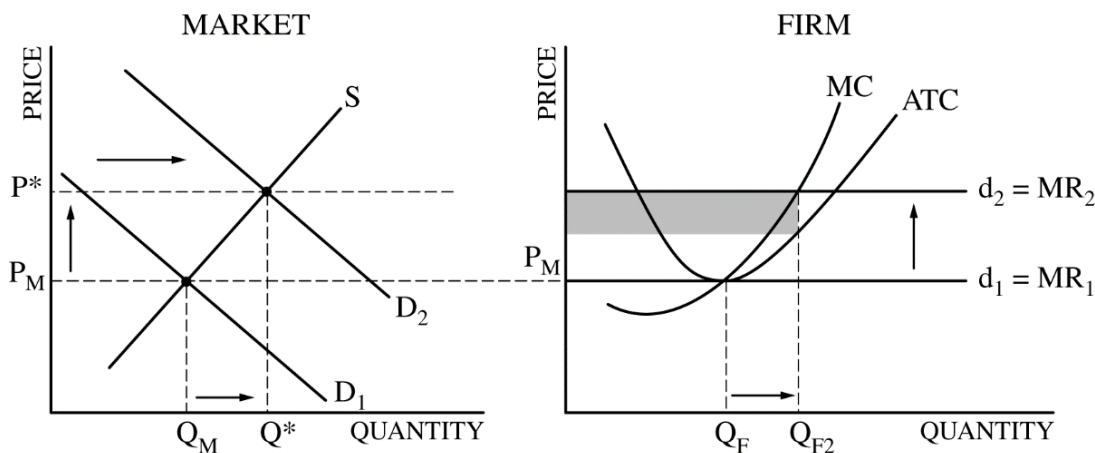
AP Microeconomics

Scoring Guidelines

2017 SCORING GUIDELINES

Question 1

10 points (4 + 2 + 1 + 1 + 2)



(a) 4 points:

- One point is earned for drawing a correctly labeled graph of the corn market with P_M and Q_M . The market demand curve must be downward sloping and the market supply curve must be upward sloping.
- One point is earned for showing a horizontal demand curve on the firm's graph extended from the market equilibrium price, P_M .
- One point is earned for identifying the firm's profit-maximizing quantity, Q_F , at marginal cost equal to marginal revenue ($MC=MR_1$).
- One point is earned for showing the firm's average total cost (ATC) curve and marginal cost (MC) passing through the minimum point of ATC, and $P = ATC = MC$ at Q_F .

Note: All quantities and prices should be labeled on the axes and connected to the intersection points by dashed lines.

(b) 2 points:

- One point is earned for showing a rightward shift of the market demand curve and a higher price and quantity, P^* and Q^* .
- One point is earned for completely shading the area representing the profit for a representative corn farmer.

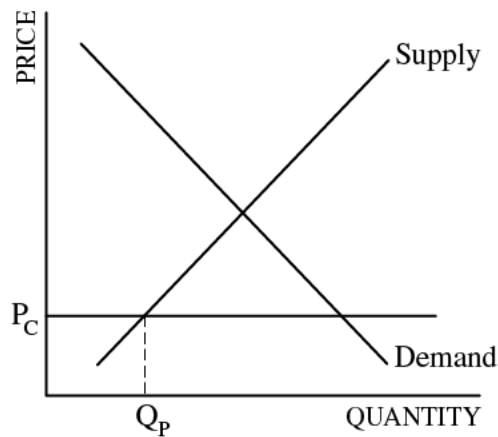
(c) 1 point:

- One point is earned for stating that the market quantity will increase and the market's price will decrease in the long run, and for explaining that new corn farmers will enter the market, which will increase the market supply curve.

2017 SCORING GUIDELINES**Question 1 (continued)**

(d) 1 point:

- One point is earned for stating that the price of soybeans in the next planting season will increase, and for explaining that the supply of soybeans will decrease because the higher price of corn encourages farmers to substitute corn for soybeans in production.



(e) 2 points:

- One point is earned for showing a correctly labeled graph of the corn market, with the price ceiling, P_C , below the equilibrium price of corn.
- One point is earned for showing the quantity purchased by consumers in the corn market labeled as Q_P where P_C intersects the supply curve.

2017 SCORING GUIDELINES

Question 2

5 points (1 + 4)

(a) 1 point:

- One point is earned for stating that the firm would be operating with increasing returns to scale and for explaining that doubling inputs will more than double output (output increases from 10 units to 50 units as a result of doubling labor and capital) **or** for explaining that average total cost decreases from \$27.50 to \$11 when labor and capital double.

(b) 4 points:

- One point is earned for correctly calculating the marginal product (MP) for the third unit of labor as 25 units and showing the work: $\frac{75-50}{3-2} = 25$.
- One point is earned for answering yes and for explaining that the MP of the third unit of labor (25 units) is less than the MP of the second unit of labor (30 units).
- One point is earned for correctly calculating the firm's average total cost (ATC) and showing the work: $\frac{75 \cdot 2}{75} + \frac{200 \cdot 3}{75} = 2 + 8 = \10 **or** $\frac{(75 \cdot 2) + (200 \cdot 3)}{75} = \frac{750}{75} = \10 .
- One point is earned for identifying the lowest output price as \$8 at which the third unit of labor would be hired.

2017 SCORING GUIDELINES**Question 3****7 points** (2 + 1 + 1 + 2 + 1)

(a) 2 points:

- One point is earned for correctly identifying the monopolist's profit-maximizing quantity, Q_3 .
- One point is earned for correctly identifying the monopolist's profit-maximizing price, P_4 .

(b) 1 point:

- One point is earned for stating that $MSC > MPC$ **or** that the MSC curve exceeds, is above, or is greater than the MPC curve.

(c) 1 point:

- One point is earned for correctly identifying the socially optimal quantity, Q_3 .

(d) 2 points:

- One point is earned for correctly identifying the dollar value of the tax, $P_4 - P_1$.
- One point is earned for correctly identifying the profit-maximizing quantity associated with the tax, Q_2 .

(e) 1 point:

- One point is earned for correctly stating that the deadweight loss increases because the monopolist's profit-maximizing quantity is equal to the socially optimal quantity before the tax and is less than the socially optimal quantity after the tax.