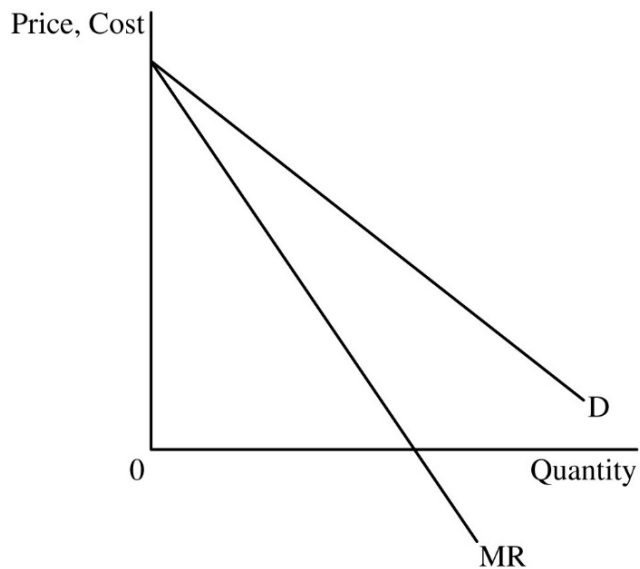
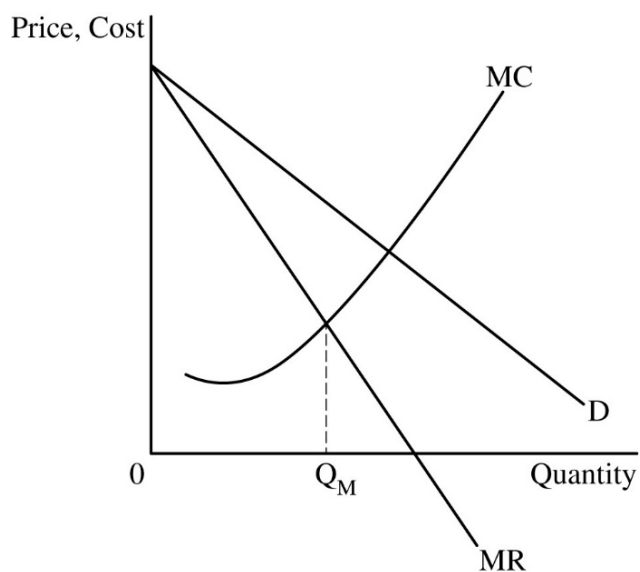


Question 1: Long**10 points**

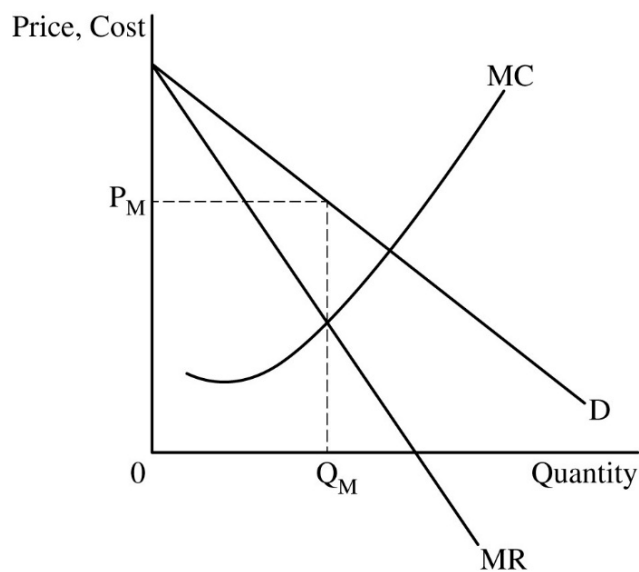
- A** Draw a correctly labeled graph for Voda Reservoir with a downward-sloping demand (D) curve and a downward-sloping marginal revenue (MR) curve with the MR curve below the D curve. **1 point**
- Point 1



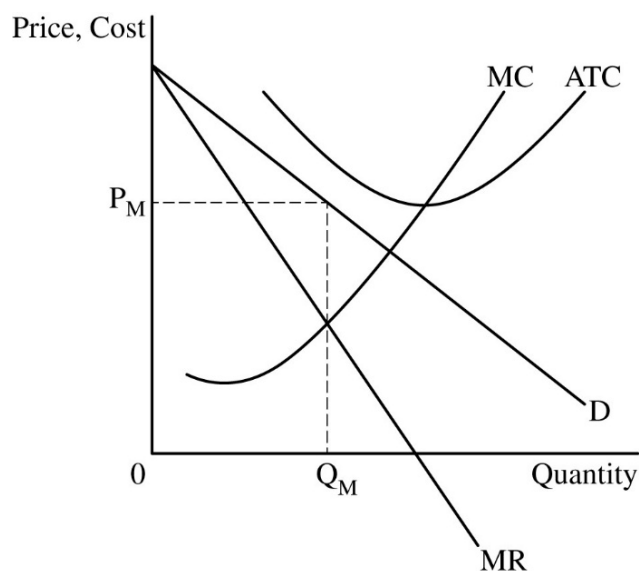
- Point 2 The graph must show a rising marginal cost (MC) curve and the profit-maximizing quantity, labeled Q_M , where $MR = MC$. **1 point**



- Point 3 The graph must show the profit-maximizing price, labeled P_M , from the D curve at Q_M . **1 point**

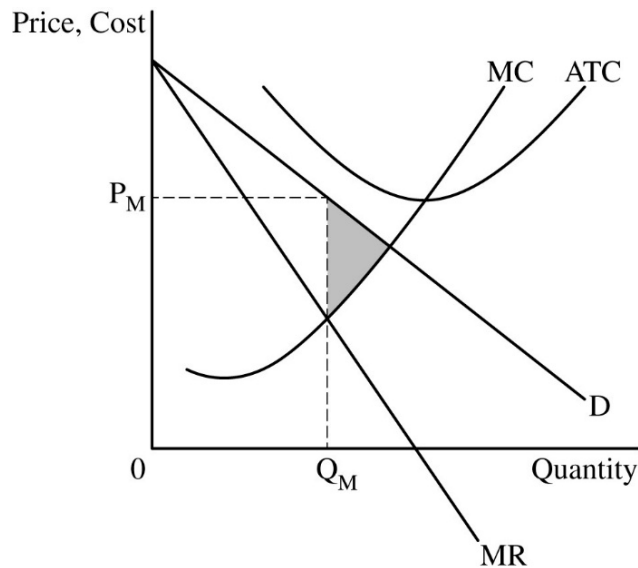


- Point 4 The graph must show the average total cost (ATC) curve above the D curve and show the MC curve passing through the minimum point of the ATC curve. **1 point**



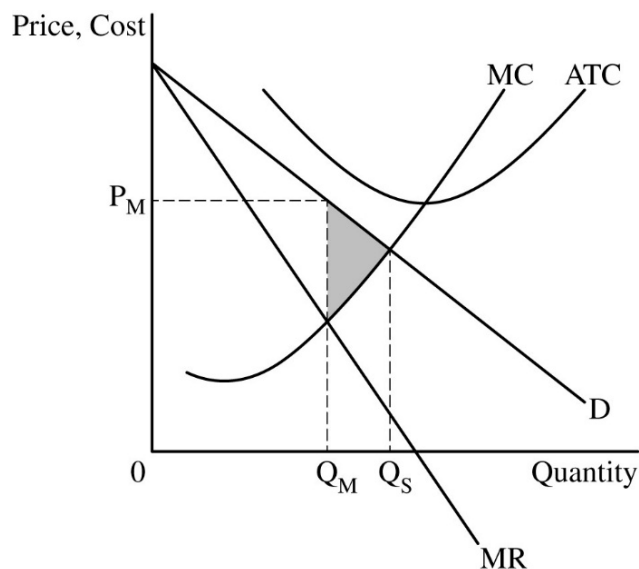
Point 5 The graph must show the area of deadweight loss, shaded completely.

1 point



B The graph from part A must show the socially optimal quantity of bottled water, labeled Q_S , from the intersection of the D and MC curves.

1 point



C State that Voda Reservoir's profit-maximizing quantity of bottled water will increase and explain with **ONE** of the following:

1 point

Point 7

- The per-unit subsidy decreases the firm's marginal cost, which shifts the MC curve to the right (down), intersecting the MR curve at a greater quantity.
- The per-unit subsidy increases the firm's marginal revenue, which shifts the MR curve to the right, intersecting the MC curve at a greater quantity.

D State that the demand for Voda Reservoir's bottled water will become more elastic.

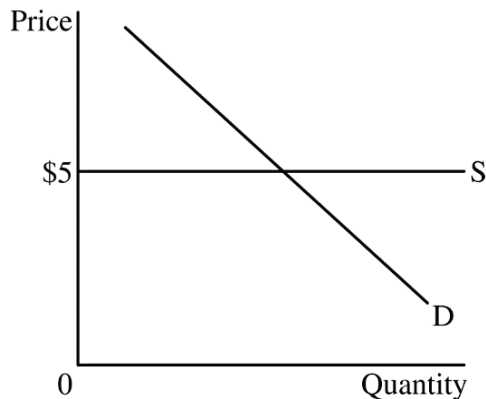
1 point

Point 8

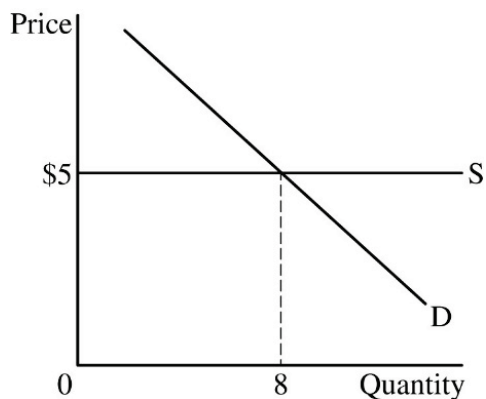
E	(i)	State that Voda Reservoir's demand for labor will increase and explain that the increase in demand for bottled water will increase the price and marginal revenue of bottled water, increasing the marginal revenue product of labor.	1 point
	(ii)	State that the market wage will increase in the short run and explain that the new regulation will decrease the supply of workers.	1 point

Question 3: Short**5 points**

- (a) Draw a correctly labeled graph of the market with a downward-sloping demand (D) curve and a perfectly elastic supply (S) curve at a price of \$5. **1 point**



For the second point, the graph must show the equilibrium quantity as 8 units. **1 point**



Total for part (a) 2 points

- (b) (i) Calculate the magnitude of the price elasticity of demand as 1.25 and show your work. **1 point**

$$\text{Price Elasticity of Demand} = \frac{\text{Percentage Change in Quantity Demanded}}{\text{Percentage Change in Price}}$$

$$= \frac{\left| \left(\frac{4 - 8}{8} \right) \times 100 \right|}{\left| \left(\frac{7 - 5}{5} \right) \times 100 \right|} = \frac{50\%}{40\%} = 1.25$$

OR

$$= \frac{\left(\frac{4 - 8}{8} \right) \times 100}{\left(\frac{7 - 5}{5} \right) \times 100} = \frac{-50\%}{40\%} = -1.25$$

- (ii) State that demand is elastic. **1 point**

Total for part (b) 2 points

- (c) State no and explain that Emily's marginal benefit should be greater than or equal to the price she is willing to pay (\$7) for the second unit. **1 point**

Total for question 3 5 points

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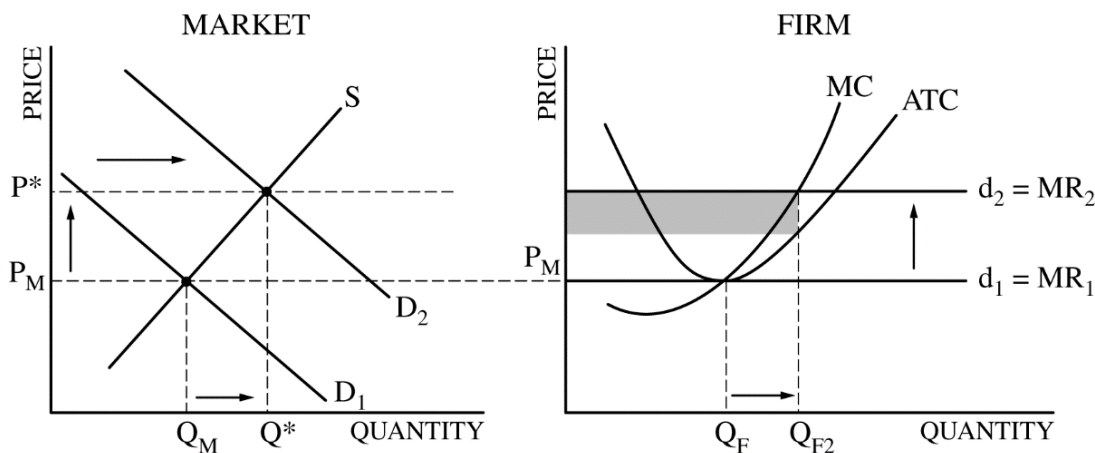
AP Microeconomics

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.

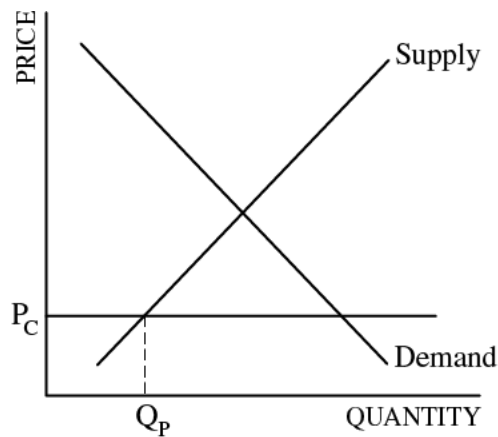
(c) 1 point:

- 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.