

AP Micro Exam Review FRQs—KEY

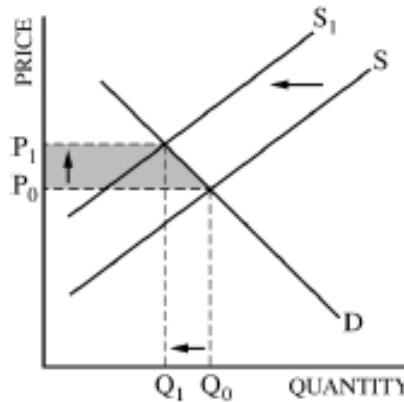
FRQ #1

10 points (3+3+4)

(a) 3 points:

- One point is earned for stating that the quantity supplied exceeds the quantity demanded at the price floor or the price floor would result in a surplus because the price floor is binding or effective.
- One point is earned for correctly calculating the price elasticity of supply. Students can use either the midpoint formula or the point elasticity formula.
 - $E = (500/1250) / (0.2/1.1) = 2.2$
 - $E = (50\%/20\%) = 2.5$
 - $E = (500/0.2) \times (1/1000) = 2.5$
 - $E = [(1500-1000)/1000] / [(1.2-1)/1] = 0.5/0.2 = 2.5$
 - $E = (500/0.2) \times (1.2/1500) = 2$
- One point is earned for stating that the supply is elastic and for explaining that the percentage change in quantity supplied exceeds the percentage change in price or because price elasticity of supply is greater than one. (Other equivalent explanations are accepted.)

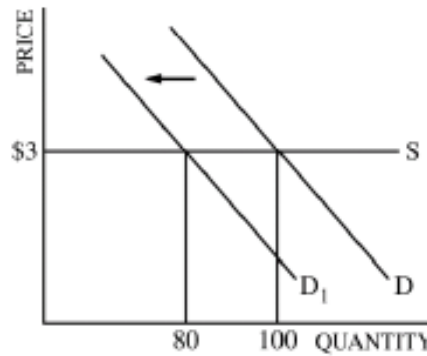
(b) 3 points:



- One point is earned for drawing a correctly labeled graph and for showing the equilibrium price and quantity, labeled P_0 and Q_0 , respectively.
- One point is earned for shifting the supply curve to the left and for showing the new equilibrium price and quantity, labeled P_1 and Q_1 , respectively.
- One point is earned for completely shading on the graph the area representing the change in consumer surplus.

(c) 4 points:

- One point is earned for stating that coffee and muffins are complementary goods.



- One point is earned for drawing a correctly labeled graph for the coffee market and showing a horizontal supply curve (S) and a downward sloping demand curve (D).
- One point is earned for shifting the demand curve to the left and for showing a decrease in the equilibrium quantity and no change in the equilibrium price of coffee.
- One point is earned for correctly calculating the new equilibrium quantity and showing the work.
 - $\% \Delta Q = (10\% \times -2) = -20\%$
 - New Equilibrium Quantity = $100 \times (-20\%) = 80$
 - OR
 - New Equilibrium Quantity = $100 - (0.2 \times 100) = 80$

(Using the midpoint formula is also acceptable.)

FRQ #2

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

(a) 1 point

- One point is earned for stating the actions that maximize the combined profits are for Patrick's Pie to "Advertise" and for Dee's Pizzeria to "Stay Out."

(b) 1 point

- One point is earned for stating that neither firm has an incentive to cheat and for explaining that Dee's Pizzeria profits would decrease from \$0 to -\$2 if Dee cheated and that Patrick's Pie's profits would decrease from \$175 to \$100 if Patrick cheated.

(c) 1 point

- One point is earned for stating that Patrick's Pie does not have a dominant strategy.

(d) 1 point

- One point is earned for stating two Nash equilibria as:
 - Patrick's Pie "Do Not Advertise" and Dee's Pizzeria "Enter"
 - Patrick's Pie "Advertise" and Dee's Pizzeria "Stay Out"

(e) 2 points

- One point is earned for correctly redrawing the payoff matrix and showing the effect of the side payment.

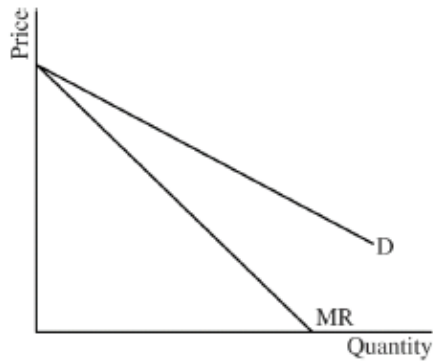
		Dee's Pizzeria	
		Enter	Stay Out
Patrick's Pie	Advertise	\$50, -\$2	\$155, \$20
	Do Not Advertise	\$150, \$15	\$80, \$20

- One point is earned for stating that the Nash equilibrium is for Patrick's Pie to "Advertise" and for Dee's Pizzeria to "Stay Out."

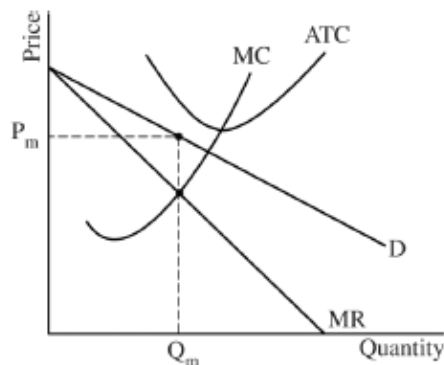
FRQ #3

9 points (5 + 1 + 1 + 2)

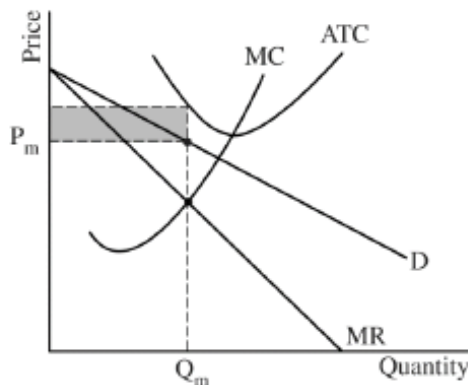
(a) 5 points:



- 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 .



- 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).

FRQ #4

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:

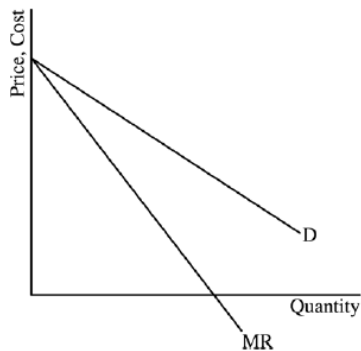
- One point is earned for identifying 8 units.
- One point is earned for stating no and explaining with one of the following reasons:
 - The quantity exchanged in the market will be less than the socially optimal quantity.
 - $MSB > MSC$ at a quantity of 8 units.
 - Deadweight loss increased after the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

FRQ #5

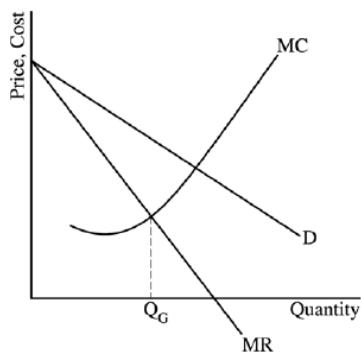
9 points (5 + 2 + 2)

(a) 5 points

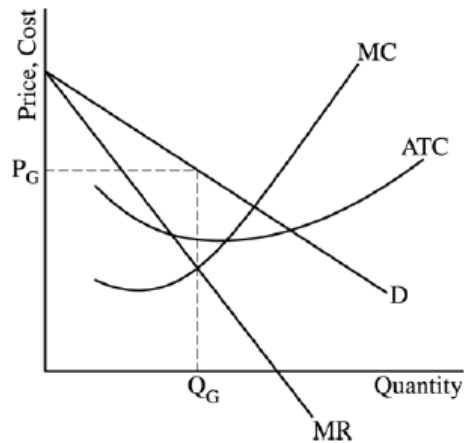
- One point is earned for drawing a correctly labeled graph of the monopoly showing downward-sloping demand (D) and marginal revenue (MR) curves with the MR curve below the demand curve.



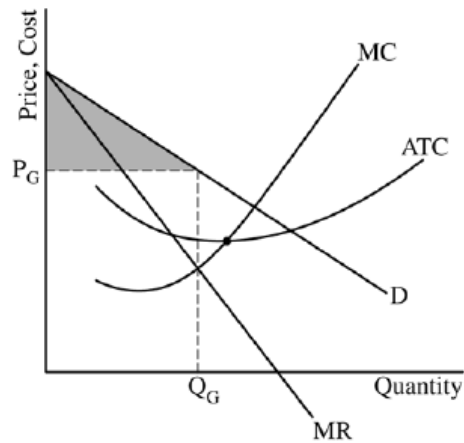
- One point is earned for showing the profit-maximizing quantity, labeled Q_G , where $MR=MC$.



- One point is earned for both showing the profit-maximizing price, labeled P_G , from the demand curve at Q_G , and above the average total cost (ATC) curve.
- One point is earned for showing the marginal cost (MC) curve rising and passing through the minimum point of the ATC curve.



- One point is earned for completely shading the area of the consumer surplus.



(b) 2 points

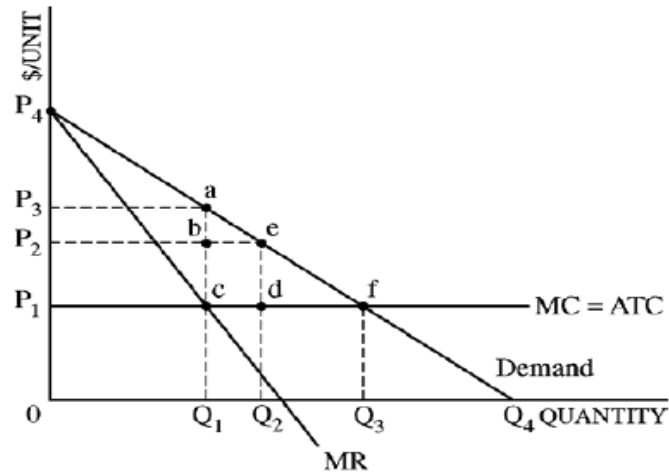
- One point is earned for stating that Gigantic Pharmaceutical Corporation's demand for warehouse workers will increase and for explaining that the marginal revenue product of labor increases because of the increase in the product price.
- One point is earned for stating that the wage rate Gigantic pays to its warehouse workers will not change and the number of workers hired will increase.

(c) 2 points

- One point is earned for stating that Gigantic's producer surplus will decrease.
- One point is earned for stating that the consumer surplus will increase and for explaining that because of the increased competition the price will decrease and the quantity will increase.

FRQ #6

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



- (a) 4 points:
- One point is earned for identifying the quantity, Q_1 .
 - One point is earned for identifying the price, P_3 .
 - One point is earned for identifying the area that represents the profit earned, P_1P_3ac .
 - One point is earned for identifying the area that represents the deadweight loss, acf .
- (b) 2 points:
- One point is earned for identifying the quantity produced, Q_3 .
 - One point is earned for identifying the area that represents the total revenue received, P_4fQ_30 .
- (c) 2 points:
- One point is earned for identifying the socially efficient quantity, Q_3 .
 - One point is earned for identifying the area that represents the consumer surplus, P_1P_4f .
- (d) 1 point:
- One point is earned for stating that the monopolist is earning zero economic profit because the price equals ATC.
- (e) 1 point:
- One point is earned for stating that point f is in the inelastic portion of the demand curve because MR is negative.

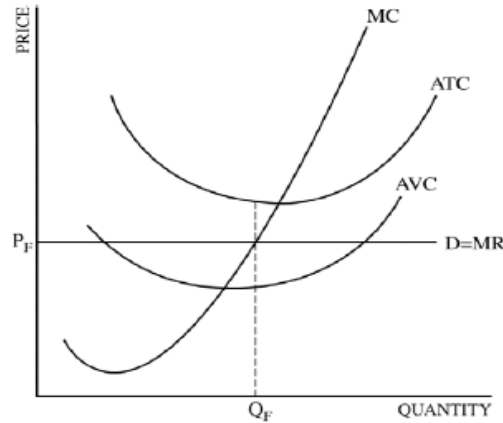
FRQ #7

Question 1: 8 points

- a) 3 points:
- 1 point - for identifying Q_3 and P_1
 - 1 point - for identifying H
 - 1 point - for identifying $I+L+T$
- b) 1 point - for identifying Q_5-Q_1
- c) 4 points
- 1 for identifying Q_2-Q_1 ; Q_2 is acceptable if part (b) is correct.
 - 1 for identifying Q_4-Q_5 ; Q_4 is acceptable if part (b) is correct.
 - 1 for identifying the loss: $L+M+N+R+S$; (retain $H+I+J+K$ not acceptable—must identify the CHANGE).
 - 1 for identifying the gain: L ; ($T + L$ not acceptable—must identify the CHANGE).

FRQ #8

10 Points (4+1+1+4)



(a) 4 points:

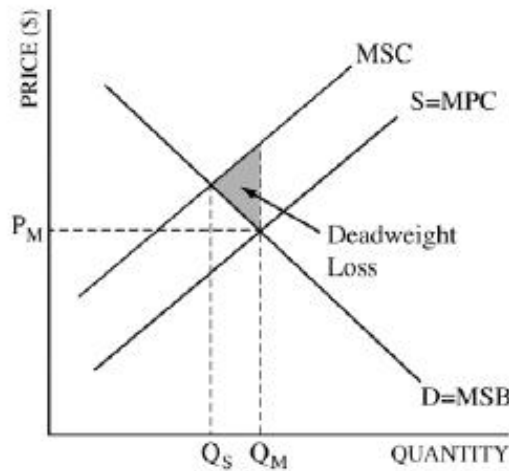
- One point is earned for showing an upward sloping MC curve going through the minimum point of the ATC curve.
- One point is earned for a correctly labeled graph of the typical firm, Fresh Farm, with a horizontal demand curve below ATC, showing P_F .
- One point is earned for showing the profit-maximizing quantity, Q_F at $MC=MR$ or $MC=P$ if P is horizontal.
- One point is earned for showing the AVC curve below the price line at Q_F .

(b) 1 point:

- One point is earned for stating that the new quantity will be less than Q_F , since demand decreases or price decreases.

(c) 1 point:

- One point is earned for stating that the long-run market supply for soybeans is perfectly elastic.



(d) 4 points:

- One point is earned for drawing a correctly labeled graph for the soybean market showing a downward sloping demand curve (or MSB), supply curve (or MPC), equilibrium quantity, Q_M , and price, P_M .
- One point is earned for drawing the marginal social cost curve above the supply curve.
- One point is earned for showing the socially optimal quantity, Q_S , at $MSB=MSC$ or $D=MSC$.
- One point is earned for showing the area representing the deadweight loss, shaded completely.

FRQ #9

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

(a) 1 point:

- One point is earned for stating that diminishing returns does not set in with the second worker because the marginal product, MP, is increasing (MP of the first worker is 60 and the MP of the second worker is 80).

(b) 1 point:

- One point is earned for calculating the $AFC = \$500 \div 250 = \2 .

(c) 1 point:

- One point is earned for stating that the profit-maximizing number of workers is 5. The MRP of the fifth worker is $\$240 >$ the wage rate $\$200$. For the sixth worker, the MRP is $\$80 <$ the wage rate of $\$200$.

(d) 1 point:

- One point is earned for stating that the number of workers hired will be less than the number of workers in part (c), because the decrease in the price of peas decreases the marginal revenue product of labor (MRP).

(e) 1 point:

- One point is earned for stating that the wage will be lower.

FRQ #10

7 points (1+2+2+2)

(a) 1 point:

- One point is earned for stating that the marginal benefit of the 3rd volleyball is \$30.

(b) 2 points:

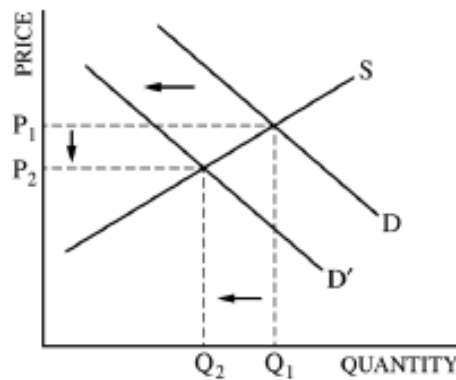
- One point is earned for the correct calculation of the total consumer surplus and showing the work.

$$CS = (\$95 - \$18) = \$77$$

OR

$$CS = (\$50 - \$9 + \$45 - \$9) = \$77$$

- One point is earned for stating that Kerri should buy 5 volleyballs to maximize her total consumer surplus, and for explaining that the marginal benefit from purchasing the fifth ball is \$10 which is greater than the price, \$9. The marginal benefit from the 6th ball is less than the price.



(c) 2 points:

- One point is earned for drawing a correctly labeled graph for the volleyball market.
- One point is earned for showing a leftward shift of the demand curve for volleyballs, resulting in a lower equilibrium price and quantity.

(d) 2 points:

- One point is earned for correctly calculating the income elasticity of demand for volleyballs:

$$IE = (-5/10) = -1/2, \text{ and}$$
- One point is earned for stating that volleyballs are inferior goods because the income elasticity is negative indicating that an increase in income decreases the demand for volleyballs.