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AP Micro Exam Review FRQs

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FRQ #1

The markets for bananas, muffins, and coffee are interrelated, and each market is perfectly competitive.

- (a) In the market for bananas, the equilibrium price is \$1.00 per pound, and the equilibrium quantity is 1,000 pounds per week. Suppose the government imposes a price floor on bananas at \$1.20 per pound, causing the quantity supplied to increase to 1,500 pounds per week.
- (i) Would the price floor result in a shortage, a surplus, or neither? Explain.
  - (ii) Calculate the price elasticity of supply if the price increases from \$1 to \$1.20. Show your work.
  - (iii) Between \$1 and \$1.20, is the supply elastic, unit elastic, or inelastic? Explain.
- (b) Bananas are an input for muffins.
- (i) Draw a correctly labeled graph of the market for muffins indicating the equilibrium price and quantity, labeled  $P_0$  and  $Q_0$ , respectively.
  - (ii) On the graph drawn in part (b)(i), show the impact of an increase in the price of bananas on the muffin market, labeling the new equilibrium price and quantity  $P_1$  and  $Q_1$ , respectively.
  - (iii) On the same graph, completely shade the area that represents the **change** in the consumer surplus caused by the increase in the price of bananas.
- (c) In the market for coffee, the equilibrium price is \$3.00 per cup and the equilibrium quantity is 100 cups per week. The cross-price elasticity of coffee with respect to muffins is  $-2$ .
- (i) Are coffee and muffins normal goods, inferior goods, complementary goods, or substitute goods?
  - (ii) Assume the supply of coffee is perfectly elastic. Using the equilibrium price and quantity given above, draw a correctly labeled graph for the coffee market, and show the impact of an increase in the price of muffins on the coffee market.
  - (iii) Given the original quantity of 100 cups of coffee per week, if the increase in the price of muffins is 10%, calculate the new equilibrium quantity in the coffee market. Show your work.

**FRQ #2**

Dee's Pizzeria

		Enter	Stay Out
Patrick's Pie	Advertise	\$50, -\$2	\$175, \$0
	Do Not Advertise	\$150, \$15	\$100, \$0

Patrick's Pie is currently the only pizzeria in College Town. It can either advertise or not advertise. Dee's Pizzeria is contemplating whether to enter or stay out of the College Town market. Each pizza establishment independently and simultaneously makes its decision. The payoff matrix above shows the profits for each combination of decisions, and both players have complete information. The first entries in the payoff matrix are Patrick's profit, and the second entries are Dee's profit.

- What actions maximize the combined total profits for Patrick's Pie and Dee's Pizzeria?
- Conditional on your response in part (a), does either Patrick's Pie or Dee's Pizzeria have an incentive to cheat on this combination of actions that maximize the combined total profits? Explain using numbers from the matrix for each pizzeria.
- Does Patrick's Pie have a dominant strategy?
- Identify the Nash equilibrium or equilibria actions for this game.
- Ignoring antitrust considerations, suppose that Patrick pays Dee's Pizzeria \$20 if Dee chooses to "Stay Out."
  - Redraw this matrix including players, actions, and payoffs, showing how Patrick's Pie payment to Dee affected the payoffs.
  - Identify the Nash equilibrium for the redrawn matrix.

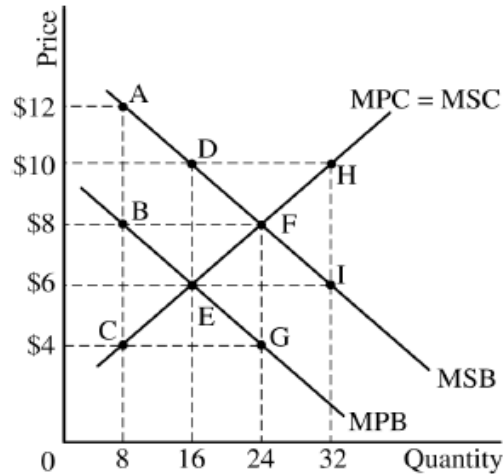
**FRQ #3**

In the early twentieth century, limited transportation options and the lack of effective substitutes gave Single Cinema monopoly power in a small town. Assume that Single Cinema is a profit-maximizing firm and currently operates at a negative economic profit in the short run.

- Draw a correctly labeled graph for Single Cinema, and show each of the following.
  - The profit-maximizing price and quantity of tickets, labeled as  $P_m$  and  $Q_m$ , respectively
  - The area representing the negative economic profit, shaded completely
- Explain why Single Cinema continues to operate in the short run despite earning negative economic profit in the short run.
- Would Single Cinema's total revenue increase, decrease, or stay the same if it decides to sell one fewer ticket than  $Q_m$ ? Explain.
- Single Cinema hires workers in a perfectly competitive labor market with a downward-sloping demand curve. Suppose the number of workers available in the market decreases.
  - What will happen to the wage rate? Explain.
  - What will happen to the marginal revenue product of the last worker hired? Explain.

#### FRQ #4

Modern-day word processing software gives consumers the ability to create and save documents in different file formats that can then be accessed by multiple computer operating systems. The graph below depicts a perfectly competitive market for word processing software. In the graph, MSB is the marginal social benefit, MPB is the marginal private benefit, MPC is the marginal private cost, and MSC is the marginal social cost.



- Identify the type of market failure illustrated by the graph. Explain.
- Using the numbers on the graph, identify the market equilibrium price and quantity.
- Using the labeling on the graph, identify the area representing the deadweight loss at the quantity identified in part (b).
- Suppose the government is considering granting a subsidy to correct the market failure. What is the dollar value of the per-unit subsidy that would achieve the socially optimal quantity?
- Suppose the government does not grant the subsidy and instead imposes a price floor at \$8.
  - How many units will consumers and producers exchange at the price floor?
  - Does the price floor correct the market failure? Explain.

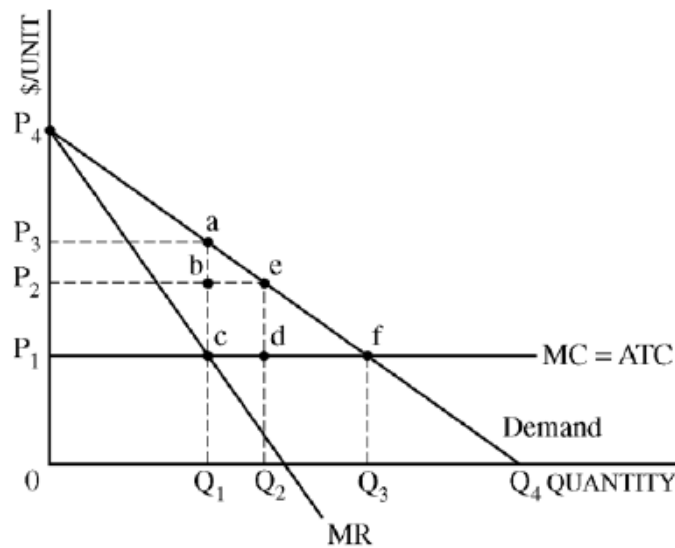
#### FRQ #5

Gigantic Pharmaceutical Corporation has a patent on a prescription drug, making it the only manufacturer of that prescription drug. Gigantic is currently earning a positive economic profit.

- Draw a correctly labeled graph for Gigantic and show each of the following.
  - The profit-maximizing quantity, labeled  $Q_G$
  - The profit-maximizing price, labeled  $P_G$
  - The average total cost curve, labeled ATC
  - The area representing the consumer surplus, shaded completely
- Suppose the demand for the prescription drug increases, and Gigantic hires its warehouse workers in a perfectly competitive labor market.
  - What will happen to Gigantic's demand for warehouse workers? Explain.
  - What will happen to the wage rate Gigantic pays its warehouse workers and the number of warehouse workers it hires?
- After Gigantic's patent expires, another firm enters the prescription drug market and produces an identical drug that sells for a lower price.
  - What will happen to Gigantic's producer surplus?
  - What will happen to the consumer surplus in this prescription drug market? Explain.

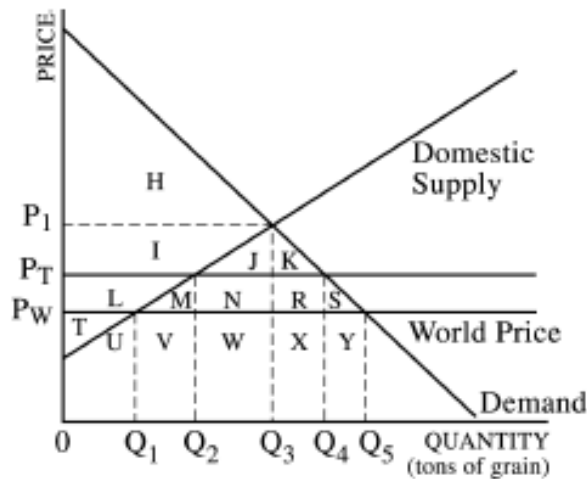
FRQ #6

The graph below illustrates the demand, marginal revenue (MR), marginal cost (MC), and average total cost (ATC) curves for a profit-maximizing monopolist.



- (a) Assume that the profit-maximizing monopolist is unregulated. Using the labeling in the graph, identify each of the following.
- The monopolist's quantity of output
  - The monopolist's price
  - The profit earned by the monopolist
  - The deadweight loss
- (b) Now assume that the monopolist can perfectly price discriminate. Using the labeling of the graph, identify each of the following.
- The quantity produced
  - The total revenue received by the monopolist
- (c) Instead, assume the monopolist charges a single price and is regulated to produce the socially efficient quantity. Using the labeling of the graph, identify each of the following.
- The socially efficient quantity
  - The consumer surplus at the socially efficient quantity
- (d) Is the monopolist facing the regulation in part (c) earning a positive economic profit, earning zero economic profit, or incurring a loss? Explain.
- (e) Is point f in the elastic, inelastic, or unit elastic portion of the demand curve? Explain.

FRQ #7



The diagram above illustrates the domestic market for grain in Country X before and after international trade. The letters inside the diagram represent areas, not points.

- (a) Using the labeling of the graph, identify each of the following before any trade occurs.
  - (i) Equilibrium price and quantity
  - (ii) Area of consumer surplus
  - (iii) Area of producer surplus
  
- (b) Using the labeling of the graph, identify the amount of grain that Country X will import if it engages in trade and the world price of grain is at  $P_W$ .
  
- (c) Now assume that Country X imposes a tariff that raises the price of grain from the free-trade case to  $P_T$ . Using the labeling of the graph, identify the change in each of the following.
  - (i) Domestic production
  - (ii) Domestic consumption
  - (iii) Consumer surplus
  - (iv) Producer surplus



**FRQ #8**

Assume soybeans are produced by a perfectly competitive, constant-cost industry. Fresh Farm is a typical firm producing soybeans and is currently operating with an economic loss.

- Using a correctly labeled graph for Fresh Farm, show each of the following in the short run.
  - The marginal cost curve and average total cost, labeled MC and ATC, respectively
  - Fresh Farm's price and loss-minimizing quantity, labeled  $P_F$  and  $Q_F$ , respectively
  - The average variable cost curve, labeled AVC
- Suppose that newspapers have recently reported that excessive soybean consumption can cause health problems. As a result, will the new loss-minimizing quantity for Fresh Farm be greater than, less than, or equal to  $Q_F$  in the short run? Explain.
- Is the long-run market supply for soybeans perfectly inelastic, relatively inelastic, unit elastic, relatively elastic, or perfectly elastic?
- Assume now that the soybean market is in a long-run equilibrium and that fertilizers used in soybean production cause water pollution. Using a correctly labeled graph for the soybean market, show each of the following.
  - Market equilibrium quantity and price, labeled  $Q_M$  and  $P_M$
  - Marginal social cost curve, labeled MSC
  - Socially optimal quantity, labeled  $Q_S$
  - The area representing deadweight loss, shaded completely

**FRQ #9**

Coldbox Corporation hires its workers in a perfectly competitive labor market and produces and sells frozen peas in a perfectly competitive product market. The market price for frozen peas is \$4 per bag. The table below shows Coldbox' short-run production of frozen peas. Labor is the only variable input. Coldbox Corporation's fixed cost is \$500.

Number of Workers	Bags of Frozen Peas
0	0
1	60
2	140
3	250
4	320
5	380
6	400

- When Coldbox hires the second worker, does it experience diminishing returns? Explain.
- Calculate the average fixed cost if Coldbox hires 3 workers. Show your work.
- If the wage is \$200 per worker, identify the profit-maximizing number of workers for Coldbox. Explain using marginal analysis.
- If the price of frozen peas decreases by \$2 per bag, would the number of workers hired by Coldbox be more than, less than, or equal to the number of workers you identified in part (c) ? Explain.
- Suppose that Coldbox hires workers from a monopsonistic labor market. Would the wage be higher, lower, or equal to the equilibrium wage in a perfectly competitive labor market?

FRQ #10

Kerri goes shopping for volleyballs. The table below shows the dollar value of the total benefit she receives from buying various quantities of volleyballs.

Volleyballs	Total Benefit
0	\$0
1	\$50
2	\$95
3	\$125
4	\$146
5	\$156
6	\$160
7	\$161

- (a) Calculate the marginal benefit Kerri receives from buying the third volleyball.
- (b) Assume the price of each volleyball is \$9.
- Calculate Kerri's total consumer surplus if she buys two volleyballs. Show your work.
  - How many volleyballs should Kerri buy to maximize her total consumer surplus from volleyballs? Explain using marginal analysis.
- (c) Assume that the market for volleyballs is perfectly competitive and that soccer balls are a substitute for volleyballs.
- Draw a correctly labeled graph of the market for volleyballs, and label the equilibrium price as  $P_1$  and the equilibrium quantity as  $Q_1$ .
  - If the price of soccer balls decreases, show the effect on the equilibrium price and quantity of volleyballs on your graph in part c(i).
- (d) Assume instead that a 10 percent increase in income causes the demand for volleyballs to fall by 5 percent.
- Calculate the income elasticity of demand for volleyballs.
  - Does the value of the income elasticity indicate that volleyballs are a normal good or an inferior good? Explain.