

REVIEW QUESTIONS FOR SECOND MIDTERM

1. The market for strawberries is perfectly competitive. The production of strawberries exhibits constant returns to scale and this is a constant cost industry.

Note: **Constant returns to scale** -- If a firm doubles its inputs, its output doubles. It implies that long run average total cost is independent of the quantity produced, i.e. it is constant, a horizontal line. **Constant Cost industry** -- an industry where input prices do not increase as output increases; long run supply is perfectly elastic.

a. Use diagrams to depict a long run competitive equilibrium for a typical strawberry producer and for the strawberry market. Show (i) a typical firm's short run marginal cost and average total cost; (ii) a typical firm's long run average total cost; (iii) the market supply and demand; (iv) the equilibrium market price; (v) industry output; (vi) the demand curve facing a typical firm; and (vii) a typical firm's output.

You should have two diagrams. The market graph will show demand and supply and the equilibrium price and output. The equilibrium price will define the demand curve facing a typical firm. The demand facing a typical firm is perfectly elastic at that price. To find the firm's profit maximizing output, find the intersection of MC and this perfectly elastic demand (Price). In the long run equilibrium, the firm earns zero economic profit so sketch the ATC curve such that (1) MC intersects ATC where ATC reaches its minimum and (2) this intersection is also where demand (price) intersects MC. Make sure you label your diagrams clearly. (For an example of a similar graph, see p.309 in text. In this graph, demand increased so your analysis will work in reverse.)

b. Concern over the use of pesticides in the production of strawberries reduces consumer demand for strawberries. Use your graph (and words) to describe the effect of this decrease in demand in the short run (i) market price; (ii) the demand curve facing an individual firm; (iii) the firm's output; (iv) industry output.

In the diagram showing the market demand and supply, sketch a new demand curve that is down to the left of the original demand (a decrease in demand). Find the intersection of this new demand and the original supply to define the new short run equilibrium price and industry output. This new price will define a new demand curve for the typical firm. In the firm diagram, show this new demand (price). Find the intersection of the new demand and the original marginal cost to define the profit maximizing output. Since the market price is lower, the firm will produce less output and will now be earning negative economic profits.

c. Describe the effect of this reduction in demand in the long run on (i) the number of firms in the industry; (ii) market price; (iii) industry output; (iv) the output of a typical firm.

Referring back to your diagram in (b), observe that the firm is losing money. Because the firm is earning economic losses, there is an incentive to exit the industry. As firms exit, market supply shifts up to the left. The decrease in supply increases the market price. In the new long run equilibrium, market supply shifts enough to return price to the original equilibrium such that $P=LRATC$. There are fewer firms in the industry. Industry output is smaller. The representative firm will produce at the minimum point on its SRATC.

d. How would your answer to (c) change if a change of this were an increasing cost industry? *An increasing cost industry is one where costs rise as the size of the industry expands. Hence, the new long run equilibrium price will be higher than the original long run equilibrium price.*

2. If the U.S. is a price-taker in the shoe industry, and the U.S. shoe industry succeeds in obtaining tariff protection, which groups in the U.S. win, and which lose from tariff protection? What does the tariff do to the overall level of economic well-being in the U.S.? A graph would be useful in answering these questions.

This question asks that you compare producer plus consumer surplus with and without tariff protection. Begin with a diagram that depicts the shoe market in the United States with a world price below the price that would obtain in the absence of trade. Review the diagram on p. 188 in your text that illustrates the case for steel. The same diagram may be used here. The tariff increases the price that would prevail in the domestic market with trade. In the graph it is a horizontal line that lies above the world price. Where this price+tariff line intersects the demand curve defines the total quantity of shoes that will be consumed in the US with the tariff. The quantity is smaller than would be consumed without the tariff. Where this price+tariff intersects the supply curve defines the quantity of shoes that will be produced by the U.S. shoe industry. This quantity is greater than it would be without the tariff. The difference between quantity consumed and the quantity supplied domestically represents imports.

Essentially, there are three groups in the United States to consider. The easiest is the U.S. government. With the tariff, the govt (taxpayers) receives a tariff revenue. The tariff revenue equals the tax times the quantity of imports. In the graph on page 188, the area labeled E represents the tax revenue. Without the tariff, the government receives nothing. Consumers are the next group. Without the tariff, consumers receive surplus defined by the area under demand and above the world price. $A+B+C+D+E+F$ in the diagram on p. 188. With the tariff, they receive a smaller surplus because of the higher price. With the tariff, consumer surplus is $A+B$. They are losers with the tariff.

Without the tariff, domestic suppliers receive producer surplus defined by the area below the world price and above the supply. This is triangle G in the diagram on p. 188. With the tariff, domestic suppliers gain the area C because of the higher price for shoes. Producers win with the tariff.

Society is worse off with the tariff. Although producers gain C and the government gains E, consumers lose C+D+E+F. There is net loss in total surplus of D+F.

3. Assume that your roommate is very messy. (According to campus policy you have a right to live in an uncluttered apartment.) Suppose (s)he gets a \$200 benefit from being messy but imposes a \$100 cost of you. The Coase theorem would suggest that an efficient solution would be for your roommate to

- a. stop (her) his messy habits or you force (her) him to move out.
- b. pay you at least \$100 but less than \$200 to live with clutter.**
- c. continue to be messy and force you to make living arrangements elsewhere.
- d. demand payment of at least \$100 but no more than \$200 to clean up after (her) himself.

*Society's happiness is maximized with a messy room. Your roommate gains \$200 and you only lose \$100. Since by campus policy, you have the property right. The roommate must purchase from you the right to be messy. This requires a payment greater than \$100. However, the maximum she will pay is \$100. **b** is the correct response.*

4. To produce honey, beekeepers place hives of bees in the fields of farmers. As bees gather nectar, they pollinate the crops in the fields increasing the yields of these fields at no additional cost to the farmer. What might be a reasonable private solution to this externality and how might the solution be reached?

This is an example of a positive externality. In fact, it is a classic example because the positive externalities run both ways. The farmers benefit from the bees. The bees benefit from the farmers. One private solution might be for the beekeepers and farmers to merge into a single firm that produces both honey and crop. One can imagine a farmer recognizing that expanding she can expand cheaply into production of honey. Another private solution would be for the beekeepers to negotiate a payment from farmers for placing the bees in the fields. (The payment might be negative if the beekeepers have a higher benefit from the fields than the farmers have from the bees.)

5. Why do salmon populations face the threat of extinction while goldfish populations are in no such danger?

Salmon are a common property resource. They are nonexcludable but depletable. Goldfish tend to be private property.

6. Tony is a wheat farmer, but also spends part of his day teaching guitar lessons. Due to the popularity of his local country western band, Farmer Tony has more students requesting lessons than he has time for if he is to also maintain his farming business. Farmer Tony charges \$25 an hour for his guitar lessons. One spring day, he spends 10 hours in the fields planting \$130 worth of seeds on his farm. He expects that the seeds he planted will yield \$300 worth of wheat. What is Tony's economic profit from the sale of this wheat?

Tony's costs are as follows:

Foregone earnings: \$250

Seeds: \$130

Total: \$380

Tony's total revenue is only \$300 so Tony's economic profit is -\$80. His accounting profit would be \$170.

7. What effect, if any, does diminishing marginal product have the shape of the marginal cost curve?

The law of diminishing marginal productivity states that the marginal product of an input declines as the quantity of the input increases, holding other inputs fixed. Because of the diminishing marginal product, in the short run, a firm must add more and more inputs to achieve the same increment in output as output expands. Adding more and more inputs means adding more and more to total cost. As output expands the increase in total cost associated with each unit change in output gets larger and larger. Marginal cost will slope up and become steeper as output expands.

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a.

Price	Number of CD's	Total Revenue	Marginal Revenue (approx)
\$24	10,000	240,000	
			200,000
\$22	20,000	440,000	
			160,000
\$20	30,000	600,000	
			120,000
\$18	40,000	720,000	
			80,000
\$16	50,000	800,000	

			40,000
\$14	60,000	840,000	

b. With a variable cost of \$5 per CD implies a constant MC of \$5. The firm operates where $MR = MC$. Marginal revenue and marginal cost will intersect around 50,000 CD's. The firm will charge a price of \$16 per CD. Profit is $\$800,000 - 250,000 = 550,000$.

c. I would demand a recording fee of \$550,000.