OLIGOPOLY

Use the following information to answer the next three questions. Suppose there are two identical firms in an industry and that the market demand curve in the industry is $Q = 2,000 − 2P$. The marginal cost of producing the good in this industry is constant and equal to $200.

1. If each firm produces the same amount and the two firms collude with one another, what is the profit-maximizing quantity and price for this industry?

a. 1,600 units of output; $200

b. 800 units of output; $200

c. 800 units of output; $600

d. 1,000 units of output; $500

2. When these two firms collude with each other, what is the level of profit received by each firm?

a. $320,000 c. $160,000

b. $480,000 d. $240,000

3. Suppose one of the firms in this industry decides to cheat on the agreement to collude. Instead of selling its product for $600, this firm decides to increase its production and sell its output for a price of $400. If the other firm continues to produce 400 units, the new price for the product will equal _____, the cheating firm's profits will equal _____ , and the noncheating firm's profits will equal _____.

a. $600; $160,000; $80,000

b. $600; $80,000; $160,000

c. $400; $160,000; $80,000

d. $400; $80,000; $160,000

4. The following payoff matrix provides information about the profits Apple Growers and Johnny Appleseed Company earn based on the advertising strategy the companies adopt. The first entry in the matrix cell gives the profits of Apple Growers, and the second entry provides the profits of Johnny Appleseed Company.

Johnny Appleseed Company

	Advertise	Not advertise
Advertise	$500 / $700	$440 / $710
Not Advertise	$550 / $600	$580 / $610

(Apple Growers on vertical axis)
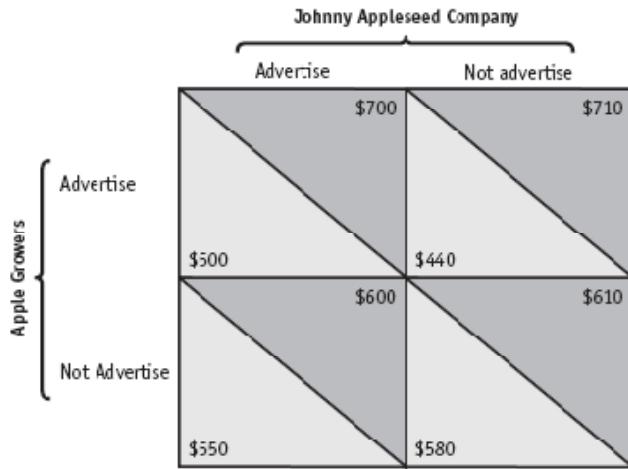
a. If these two firms could collude with one another and decide jointly on their advertising strategy with the goal of maximizing their joint profits, what combination of strategies results in the greatest joint profit for these two companies?

b. Which strategy is Apple Growers' dominant strategy?

c. Which strategy is Johnny Appleseed Company's dominant strategy?

d. What is the Nash equilibrium for this game?

Exercises (*for practice at home*).

1. Firms in an oligopoly have achieved tacit collusion and decided that each firm will produce 20 units of output and sell each unit of output for $80. Each firm perceives that the demand for their product if they raise the price above $80 can be expressed by the equation

$$P = 90 - (0.5)Q$$

Each firm also perceives that the demand for their product if they lower the price below $80 can be expressed by the equation

$$P = 100 - Q.$$

a. Draw a diagram illustrating the kinked demand curve for one of the firms in this oligopoly. Label the agreed upon price and quantity as well as the firm's demand curve (hint: this demand curve will contain a segment from both of the given demand curves).
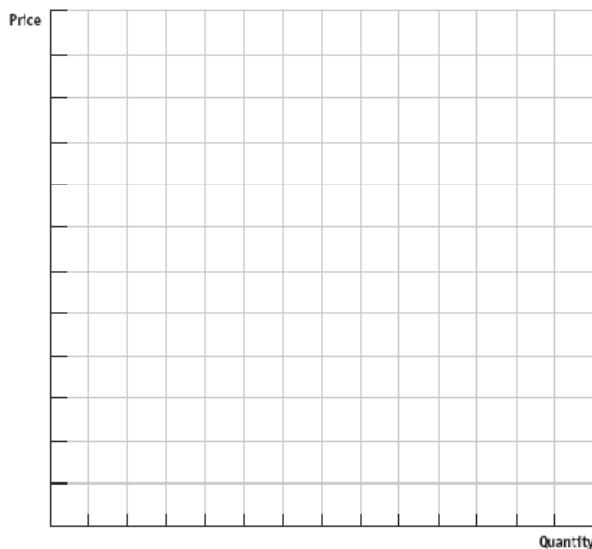
b. On your diagram from part (a), draw the firm's *MR* curve. Remember that the firm's *MR* curve will have a discontinuity (in this case, a vertical segment) due to the kink in its demand curve.

c. Suppose that one of the firms in this industry decides to reduce the price of its product from $80 to $78. What does this model predict will happen to the demand for this firm's product?

d. Suppose that one of the firms in this industry decides to increase the price of its product from $80 to $84. What does this model predict will happen to the demand for this firm's product?

e. Suppose that one of the firms in this industry has marginal cost equal to $2.9Q + 10$. What price and output combination is the profit-maximizing output for this firm?

f. Suppose that another of the firms in this industry has marginal cost equal to $3Q + 5$. What price and output combination is the profit-maximizing output for this firm?

g. Explain why your answers in parts (e) and (f) are the same even though the two firms have different *MC* curves.

2. Suppose there are only two firms in an industry that produces gasoline. To make the analysis simpler, assume that once the companies have incurred the fixed costs of production the marginal cost of producing another gallon of gasoline is equal to zero. Suppose the demand for gasoline in this market is equal to $Q = 10{,}000 - 1{,}000P$.

a. Draw a graph of the industry demand curve, and draw the *MC* curve for the industry as well.
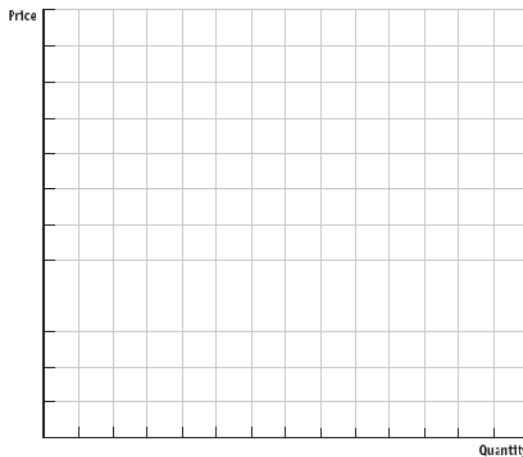
b. If these two firms acted like perfectly competitive firms, how many units would they produce altogether? What would the total revenue for the two firms equal?

c. Suppose these two firms are able to form a cartel in which they agree to produce the profit-maximizing level of output and then split the market evenly. What is the total amount of output these two firms will produce if they agree to split the market? What is the price of gasoline? What will be the total revenue received by each firm if they agree to split the market and neither firm cheats on this agreement? Are the two firms better off if they agree to this arrangement?

d. On a graph, indicate the market quantity *Q** that these two firms will produce under the arrangement described in part (c). On this same graph, indicate the market price *P** that will be charged for the gasoline.