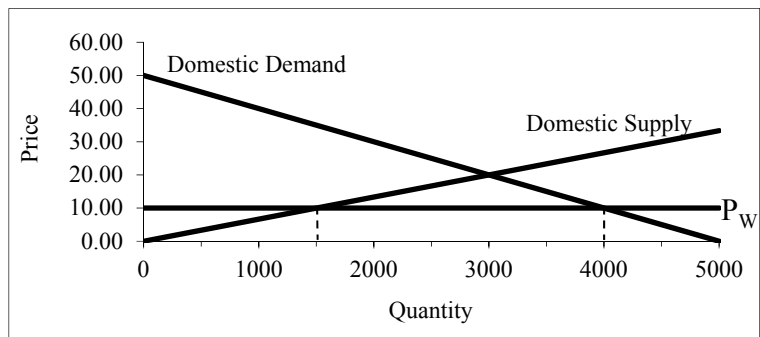


QUESTION 1

The domestic demand curve for portable fans is given by $Q_d = 5000 - 100P$, where Q_d is the number of fans that would be purchased when the price is P . The domestic supply curve for fans is given by $Q_s = 150P$, where Q_s is the quantity of fans that would be produced domestically if the price were P . Suppose fans can be obtained in the world market at a price of \$10 per fan. Domestic fan producers have successfully lobbied Congress to impose a tariff of \$5 per radio.

- Draw a graph illustrating the free trade equilibrium (with no tariff). Clearly illustrate the equilibrium price.
- By how much would the tariff increase producer surplus for domestic fans suppliers?
- How much would the government collect in tariff revenues? What is the deadweight loss from the tariff?
- How different would the result be if the government had used a quota instead of a tariff to get a similar Q result? Explain and show on a graph is possible.

- a) In the free trade equilibrium, domestic demand will be 4000, domestic supply will be 1500, and imports will be 2500 units.



- b) With the tariff, domestic demand will fall to 3500 units and domestic supply will increase to 2250 units. Thus, 1250 units will be imported.

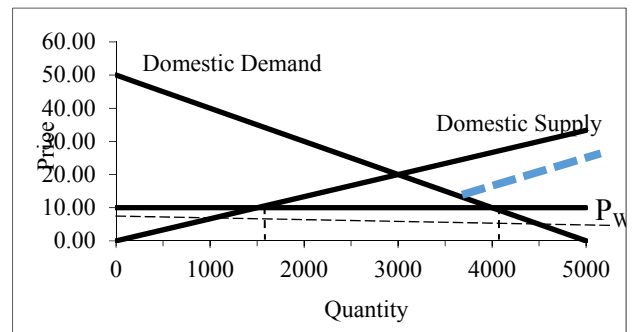
The producer surplus with free trade would be $\frac{1}{2}(10 - 0)(1500) = 7,500$. With the tariff, domestic supply will increase to 2250 and producer surplus will increase to $\frac{1}{2}(15 - 0)(2250) = 16,875$. So producer surplus will increase by 9,375.

- c) A tariff of \$5 on each of those units will result in government receipts of 6,250.

The deadweight loss from the tariff will come from two sources. First, the deadweight loss associated with the overproduction of domestic suppliers will be $\frac{1}{2}(2250 - 1500)5 = 1,875$. Second, the deadweight loss associated with the reduction in consumption by consumers due to the tariff is $\frac{1}{2}(4000 - 3500)5 = 1,250$. Therefore, the total deadweight loss with this tariff is 3,125.

- d) With a quota, the government could restrict the imports to the same level but then would not collect tariff revenue. Thus, the DWL would be greater and include 3125 (as above) plus the 6250 amount as well that is no longer collected via tariff.

Dashed line represents the tariff placed on the good
 Dashed blue line represents quota placed onto the good



Extra info for calculation:

ES before open mkt $P^d = 20$ $Q^d = 30000$

$$CS = \frac{1}{2} (50 - 20)(30000) = 450000$$

$$PS = 30,000$$

$$\underline{\underline{75,000 \text{ ES}}}$$

ES with WP = 10

$$CS = \frac{1}{2} (50 - 10)(40000) = 800000$$

$$PS = 7,500$$

$$\underline{\underline{87,500 \text{ ES}}}$$

ES with TARIFF

$$CS = \frac{1}{2} (50 - 15)(35000) = 61,250$$

$$PS = 16,875$$

$$\underline{\underline{78,125 \text{ ES}}}$$

↓ ES closed mkt to TARIFF

$$75,000 - 78,125 = \underline{\underline{3125}} \text{ DWL} \\ \text{DUE TO TARIFF}$$

QUESTION 2

- a) What does “perfect competition” mean? State a few of the underlying assumptions.
 - b) Explain in words why the demand curve a firm faces in a perfectly competitive market is horizontal.
 - c) For an individual firm in a perfectly competitive market, the marginal revenue, MR, is equal to the price, p . Why is that?
-
- a) Frequently used assumptions include
 - All agents are price takers, i.e. they take prices as given. This will be true if there are many buyers and sellers.
 - Homogenous products.
 - There are no barriers to entry or exit. All input factors, labor and capital, are completely variable.
 - All agents have perfect information about all existing alternatives in the market.
 - No cartels, i.e. no agents can cooperate about prices.
 - b) This depends on the fact that all agents are price takers. If the firm cannot affect the price, then the price is independent on the quantity produced. Consequently, the price becomes a horizontal line.
 - c) Since the firm cannot affect the price, each unit will be sold at the same price. Thereby, the marginal revenue is exactly what the consumer pays for the good. The MR curve therefore becomes identical to the price curve, i.e. a horizontal line.

QUESTION 3

- a) Describe in a few sentences how to derive the market's short-run supply curve from the individual firms' short-run MC curves.
 - b) Describe how to find the markets' long-run supply curve.
-
- a) The short-run supply curve of an individual firm is the part of the MC curve that lies above AVC curve. The short-run supply curve of the market is the horizontal sum of the short-run supply curves of all individual firms.
 - b) In the long run, the number of firms can vary. The market's long-run supply curve is therefore *not* the sum of the long-run supply curves of individual firms.

The market's long-run supply curve is instead obtained from the relation between the production cost and the scale of the production. A downward-sloping supply curve reflects economies of scale, whereas an upward-sloping one reflects diseconomies of scale. In the intermediate case, the supply curve is horizontal.

QUESTION 4

Countries A and B only produce 2 goods, skis and snowboards. The following table shows how many units can be produced in each country per week at two different production points. Assume that the production possibility frontier in both countries is linear.

Country Snow (production per week)		Country Ice (production per week)	
Skis	Snowboards	Skis	Snowboards
15	25	15	10

- a) Develop a chart of opportunity costs and indicate who has the comparative and the absolute advantage in Skis and in Boards?
 b) When these two countries trade what is the result in terms of skis and snowboards to their citizens? Explain. Do not calculate anything.

- a) Develop a chart of opportunity costs and indicate who has the comparative and the absolute advantage in Skis and in Boards?

OC = Give Up / Gain

	<i>OC of Skis</i>	<i>OC of Snowboards</i>
<i>Country Snow</i>	$25/15 = 1.67$	$15/25 = 0.60$
<i>Country Ice</i>	$10/15 = 0.67$	$15/10 = 1.5$

Country Ice Comparative advantage in Skis
Country Snow Comparative advantage in Snowboards
Basis lowest opportunity cost

- b) When these two countries trade what is the result in terms of skis and snowboards to their citizens? Explain. Do not calculate anything.

By applying the concept of specialization (country specializes in making the good which they have the lowest OC) each country will end up with more skis and snowboards than if they did not trade and allocated their resources to making both products.

QUESTION 5

Consider the small closed economy of CCCLand and its market for coffee. Currently, the domestic demand and supply curves for coffee are given by the following equations:

$$\text{Domestic Demand: } P = 1000 - (1/5)Q$$

$$\text{Domestic Supply: } P = 200 + (1/15)Q$$

Furthermore, you know that the world price of coffee is equal to \$300 per unit of coffee. Hint: you will likely find it helpful to draw a sketch or several sketches as you proceed with this problem.

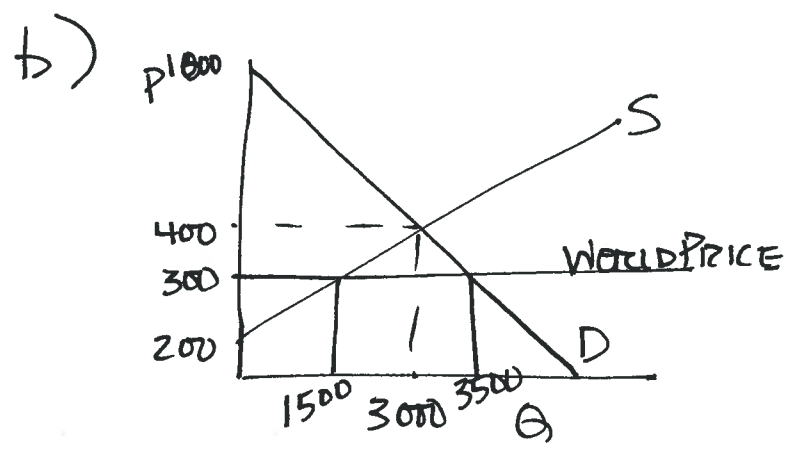
- a. If CCCLand remains a closed economy, what will be the equilibrium price and quantity in the market for coffee in this economy?
- b. Suppose CCCLand opens the coffee market to trade. Will CCCLand import or export coffee when it changes its status from a closed economy to an open economy? Explain your answer.
- c. Calculate the value of consumer surplus in the coffee market when CCCLand is a closed economy and the value of consumer surplus in the coffee market when CCCLand is an open economy. Will domestic consumers be in favor of opening the market to trade? Explain your answer.
- d. Calculate the value of producer surplus in the coffee market when CCCLand is a closed economy and the value of producer surplus in the coffee market when CCCLand is an open economy. Will domestic producers be in favor of opening the market to trade? Explain your answer.
- e. Suppose that the market for coffee in CCCLand is open to trade but that the government of CCCLand wishes to reduce imports of coffee to 1000 units of coffee through the imposition of a tariff. How big will the tariff need to be in order for CCCLand to reach their goal? Explain your answer.
- f. How much tariff revenue will be raised with the imposition of the tariff described in part (e)?
- g. What is the deadweight loss from the imposition of the tariff described in part (e)?

Qu 5 a) $1000 - \frac{1}{5}Q = 200 + \frac{1}{15}Q$

$800 = \frac{1}{15}Q + \frac{3}{15}Q$

$800 = .2667Q$

$Q^* = 3000$ $P^* = 400$



At $P = 300$

CONSUMERS DEMAND 3500 units
 PRODUCERS SUPPLY 1500

2000 UNITS IMPORTED
 TO MEET SHORTAGE IN
 COUNTRY

c) CS closed economy = $\frac{1}{2} (3000) (1000 - 400) = \underline{\underline{\$ 900,000}}$

CS open economy = $\frac{1}{2} (3500) (1000 - 300) = \underline{\underline{\$ 1,225,000}}$

OPENING MKT TO THE WORLD \uparrow CS

BY $\underline{\underline{\$ 325,000}}$

$$d) \text{ PS closed economy} = \frac{1}{2} (3000)(400-200) = \underline{\$ 300,000}$$

$$\text{PS open economy} = \frac{1}{2} (1500)(300-200) = \underline{\$ 75,000}$$

OPENING MKT TO WORLD \downarrow PS

$$\text{BY } \underline{\$ 225,000}$$

e) TARIFF TO \downarrow MPORT FROM 2000 \rightarrow 1000

$$\text{WANT } \underline{Q_s + 1000 = Q_D}$$

$$\text{GIVEN } Q_D = 5000 + 5P \quad \& \quad Q_S = 15P - 3000$$

(Rewriting original equations)

$$15P - 3000 + 1000 = 5000 + 5P$$

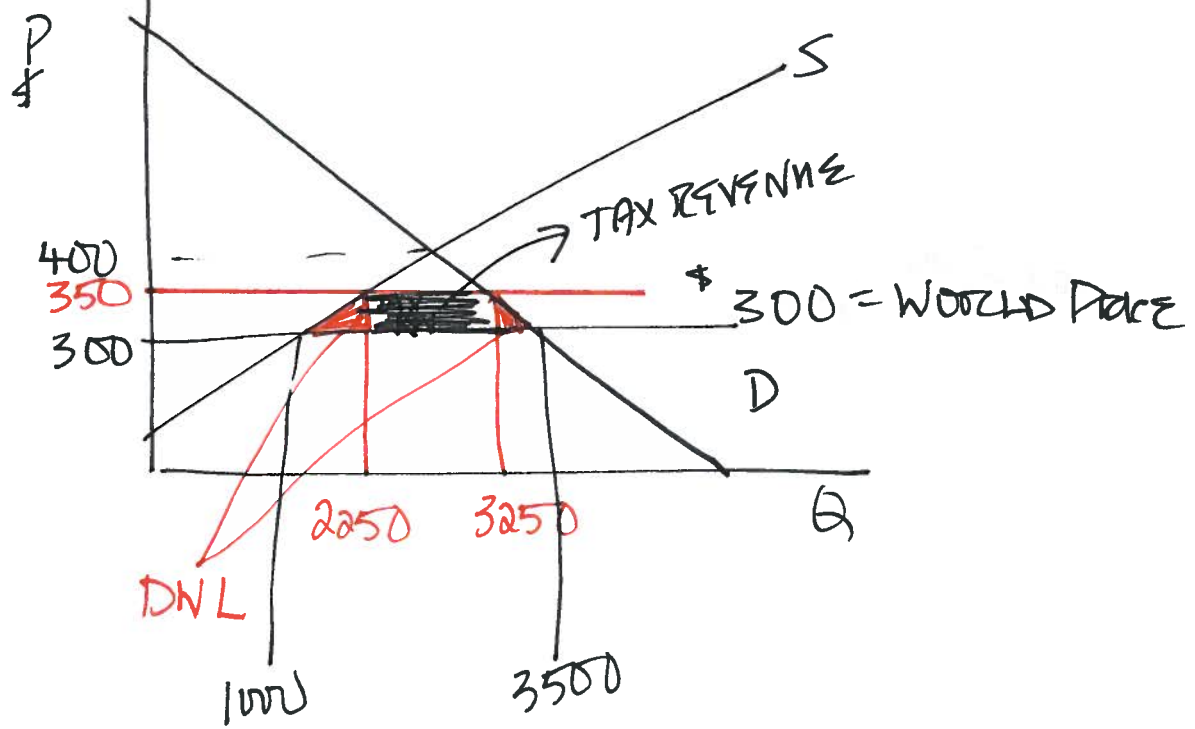
$$20P = 5000 + 3000 - 1000$$

$$P = \underline{\$ 350} \text{ Need to have } Q \text{ restricted}$$

to 1000 M ports

\therefore hold $P = 300$ + $P = 350$ required
 so that tariff must equal \\$ 50

e) continued



f) TARIFF REVENUE = $\$ 50 \times 1000$ UNITS
 $= \underline{\underline{\$ 50,000}}$

g) DNL $\frac{1}{2} (-300 + 350)(2250 - 1000) +$
 $\frac{1}{2} (-300 + 350)(3500 - 3250)$
 $= \underline{\underline{\$ 25,000}}$

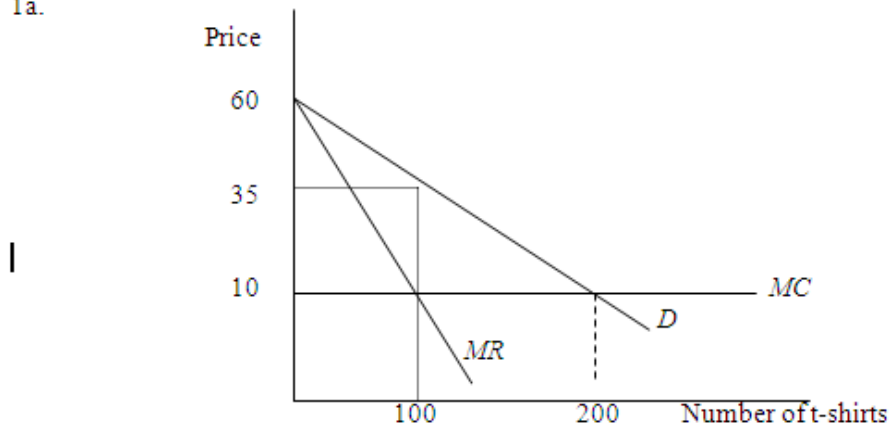
QUESTION 6

You own and operate a t-shirt stand. Your demand curve is given by $P = 60 - 0.25Q$. Your marginal cost curve is $MC = 10$. Your fixed costs equal \$300.

- Graph your demand and marginal cost curves.
- Derive and graph your marginal revenue curve.
- Calculate and profit maximizing price and quantity, and show them on your graph.
- Calculate your profit.
- Calculate consumer surplus at the profit-maximizing price and quantity.
- Explain the deadweight loss and distributional effects due to monopoly.

Problems/Short Answer

1a.



- $MR = 60 - 0.5Q$.
- Profit-maximizing price = \$35, profit-maximizing quantity = 100.
- Profit = $TR - TC = (\$35 \times 100) - [\$300 + (\$10 \times 100)] = \1200 .
- Consumer surplus = $(\frac{1}{2})(\$100)(25) = \1250 .
- $DWL = \frac{1}{2}bh = \frac{1}{2} \times 100 \times 25 = 1,250$

Distribution effect :

If this was a perfectly competitive market structure,

the equilibrium would be $q=200$ and $p = 10$. The consumer surplus would be $\frac{1}{2} \times 50 \times 200 = 5000$. Producer surplus is zero Total economic surplus = 5000.

However, because it is a monopoly market structure, this allows consumer surplus of 1250 and the monopoly/producer surplus of $25 \times 100 = 2500$ and $DWL = 1250$. Economic surplus = 3750.

Producer gets more, consumer gets less and DWL results because of monopoly.

QUESTION 6

- a. Describe the distinguishing characteristics of monopolistic competition?
- b. How do firms in monopolistic competition compete?
- c. How do monopolistic competition firms differ from perfect competition in terms of efficiency, excess capacity, profit, price markup and production decisions?

a) **What are the distinguishing characteristics of monopolistic competition?**

Monopolistic competition is a market structure in which: a large number of firms compete; each firm produces a differentiated product; firms compete on product quality, price, and marketing; firms are free to enter and exit the industry.

b) **How do firms in monopolistic competition compete?**

Firms in monopolistic competition compete in three areas: Quality—the physical attributes of a product, including the product's design and reliability, the service provided to the buyer, and the ease of access to the product; price—because the firms produce differentiated products, each firm faces a downward-sloping demand curve for its own product; and marketing—firms must make consumers aware of the quality of their differentiated products through advertising and packaging.

c)

Efficiency

Monopolistic competition is not efficient by the requirement for allocative efficiency $MSB = MSC$. The price equals the consumer's willingness to pay, which is the marginal social benefit and the firm's marginal cost is the marginal social cost. Product differentiation in monopolistic competition means that $P > MR$, which implies that $P > MC$ at the quantity where $MR = MC$. Because $P = MSB$ and $MC = MSC$, the result is that $MSB > MSC$, which signals inefficiency. However, when compared to the perfectly competitive alternative that all goods are identical, the variety offered by monopolistic competition makes monopolistic competition potentially efficient.

Excess capacity

A firm's capacity output is the output at which average total cost is at its minimum. In monopolistic competition in the long run, $MR = MC$ and $P = ATC$. In long run equilibrium, it is the case that $MC < ATC$, which means that ATC is falling in this range and so production occurs at an output level that is less than capacity output.

Profit

A firm in monopolistic competition can make an economic profit only in the short-run because economic profit induces entry, which decreases the demand for the firm's product, lowers its profit-maximizing output, price, and economic profit. In long-run equilibrium, when entry ends, each firm makes zero economic profit.

Mark Up

A firm's markup is the amount by which price exceeds marginal cost. There is a markup in monopolistic competition because $P > MR$ at all levels of output. Since the firm produces the quantity at which $MR = MC$, the fact that $P > MR$ means that $P > MC$, so that there is a markup.

Production

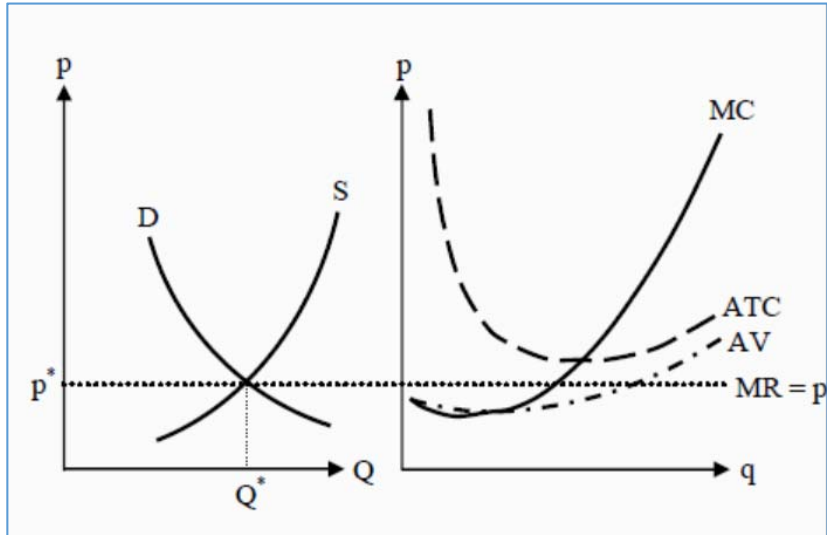
A firm produces the output at which marginal revenue equals marginal cost ($MR = MC$) because this output maximizes profit. The price is determined from the demand curve and is the highest price consumers are willing to pay for the profit-maximizing quantity.

Decision

QUESTION 7

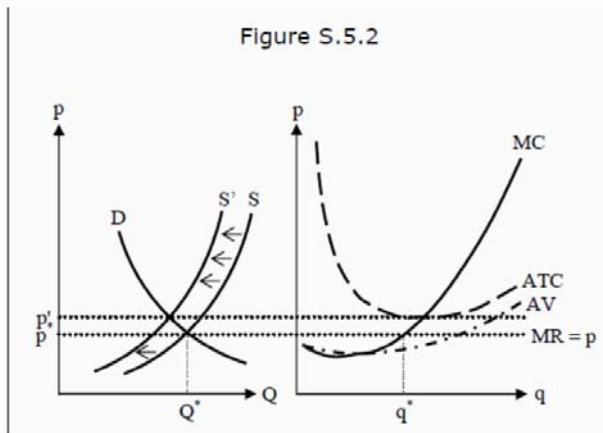
Use the following curves and graphs, market on the left-hand side and the individual firm on the right-hand side, to answer the questions in this question.

- What type of market and firm is depicted in the graph? How can you tell this? Explain.
- Will the firm make a profit, loss or break even in the short run? Why? How much will it produce?
- Describe the forces that will affect this situation in the long run. How will long run equilibrium arise? What will happen to P ? Q ? number of firms? Profit or loss of other firms?



- This is a perfectly competitive firm (right hand side) because the firm faces a horizontal Demand curve ($MR = P = D$) indicating they do not have market power and are a price taker.

- The firm makes a short-run loss. That depends on the fact that the price it is able to demand per unit, p^* , is below the average total cost, ATC. The firm will still produce the quantity q^* (where $MR = MC$) in the short run, since it is then able to recover some of its fixed cost. This is due to p^* being above the average variable cost, AVC.



c) Long Run

- b) In the long run, the firm cannot accept making a loss. Either it decides to shut down, or the market will change. In a perfectly competitive market, where there are no barriers to leave (or to entry), some of the firms will leave the market.

As there are fewer firms in the market in the long run, the market can offer fewer units at each given price. That means that the supply curve will shift to the left. As long as the equilibrium price is below ATC, firms will continue to get pushed out of the market.

When enough many firms have left the market, S has shifted to S' in Figure S.5.2, and consequently the price has been pushed up from p^* to p' . At that price, $p' = MR$ is a tangent to ATC. The average revenue is then just as large as ATC, and the profit is therefore zero. Since none of the firms makes a loss, neither in the short run or in the long run, no more firms will be pushed out of the market. A long-run equilibrium has therefore been reached.

QUESTION 8

- a. What are the two distinguishing characteristics of oligopoly?
- b. Why are firms in oligopoly interdependent and tempted to collude?
- c. What is prisoners' dilemma and how does it relate to oligopoly firms? Please be sure to explain the concept of prisoners' dilemma as part of your answer.

a) **What are the two distinguishing characteristics of oligopoly?**

Oligopoly has two distinguishing characteristics: Natural or legal barriers prevent the entry of new firms, and a small number of firms compete in the industry.

b) **Why are firms in oligopoly interdependent?**

Firms in oligopoly are interdependent because with a small number of firms, each firm's actions influence the profits of all the other firms.

Why do firms in oligopoly face a temptation to collude?

Firms in oligopoly face the temptation to collude because they can increase profits by forming a cartel and acting like a monopoly.

- c) In the prisoners' dilemma game, each prisoner faces two strategies: confess or deny. There are four outcomes: i) Both prisoners confess and each receives more years in prison than if they both deny, ii) both prisoners deny, iii) prisoner A confesses and prisoner B denies, and iv) prisoner B confesses and prisoner A denies. In these last two outcomes, the confessing prisoner gets a lower sentence than if both confessed and lower than if they both denied. The dominant strategy for both prisoners is to confess. Regardless of what the other prisoner does, the best strategy for each prisoner is to confess, and both prisoners confess. This outcome is worse for both prisoners than if they each denied the crime, which creates the dilemma.