Oligopoly

Microeconomics for Students of Accounting, Finance, and Digital Applications

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Introduction

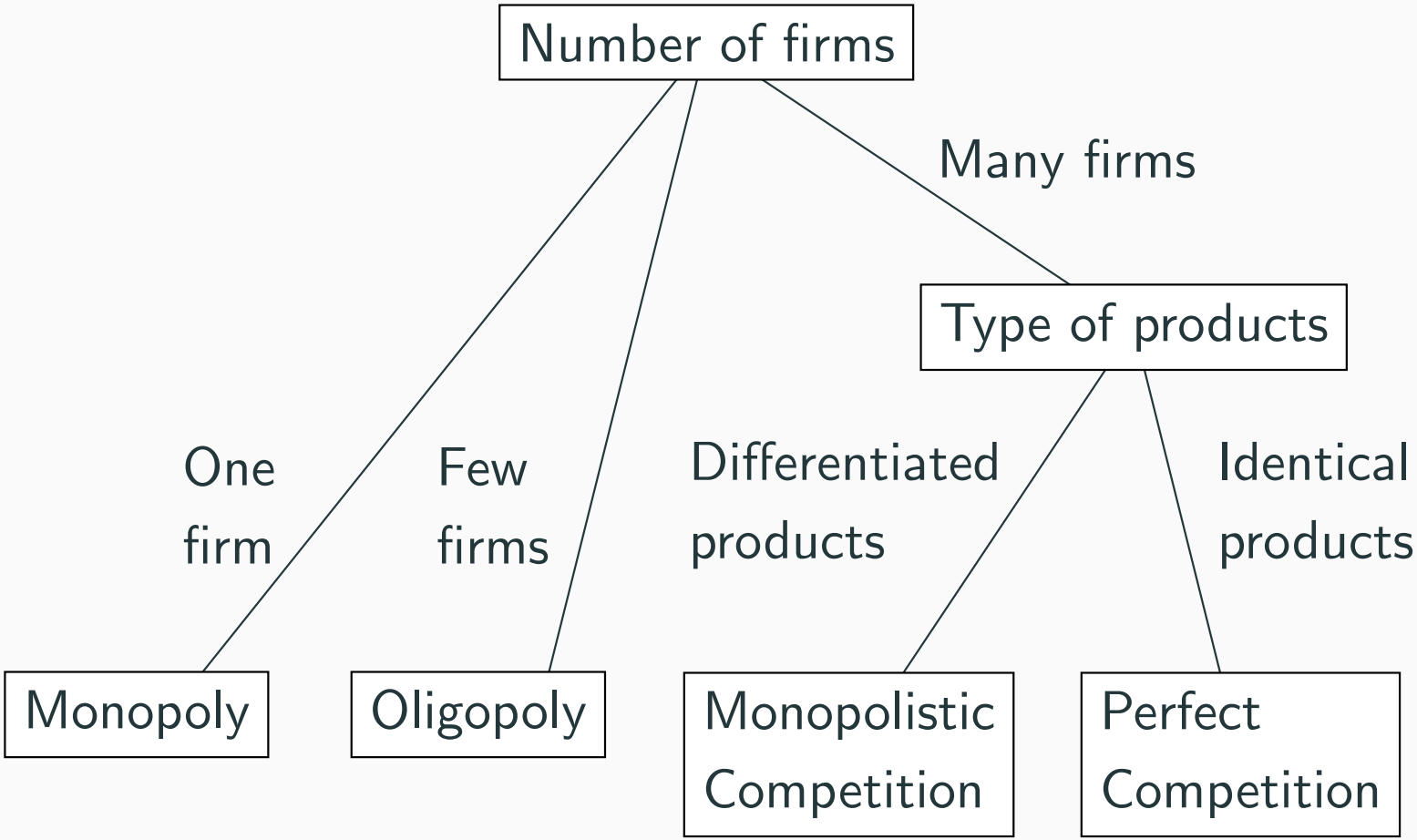
Introduction

YOU have already learned

- why owning stock of a firm with significant market power and/or employment by such firm may be very lucrative
- how market power is determined by the number of firms and the existence of barriers to entry

Now YOU are going to learn more about how having a low number of firms in an industry creates conditions for strategic behavior that may possibly result in sustained abnormal profit

Key Characteristics of Oligopoly



Oligopoly

oligopoly a market structure in which only a few sellers offer similar or identical products

🌎 sugar, tobacco products, gas distribution, oils and fats, confectionery, man-made fibres, coal extraction, soft-drinks and mineral waters, pesticides, weapons and ammunition in UK; beer, tennis balls, refrigerators, cars in USA

⚖ whether a market is an oligopoly or not is measured by its *concentration ratio* BUT there isn't a single clear-cut number to determine when a market becomes an oligopoly; the *concentration ratio* is highly dependent on the geographic boundaries of the market under consideration

Markets with Only a Few Sellers

Duopoly

duopoly a market structure in which only two sellers offer similar or identical products

🌎 Pat and Pete are the owners of the only two water wells in a small village and each resident who wants water needs to pay one or the other for access to the well based on how much water he or she wants to use

⚖ this example is useful not because of its realism but for pedagogical reasons — the duopoly is the simplest market structure which illustrates the main features of oligopoly

Duopoly Example: Demand Schedule for Water

Quantity (liters)	Price ($)	Total Revenue ($)
0	100	0
10	90	900
20	80	1,600
30	70	2,100
40	60	2,400
50	50	2,500
60	40	2,400
70	30	2,100
80	20	1,600
90	10	900
100	0	0

Perfect Competition (Zero Marginal Cost Assumption)

Quantity (liters)	Price ($)	Total Profit ($)
0	100	0
10	90	900
20	80	1,600
30	70	2,100
40	60	2,400
50	50	2,500
60	40	2,400
70	30	2,100
80	20	1,600
90	10	900
$\mathbf{2\times 50 = 100}$	$\mathbf{0}$	$\mathbf{2\times 0 = 0}$

Colluding Duopolists (Zero Marginal Cost Assumption)

Quantity (liters)	Price ($)	Total Profit ($)
0	100	0
10	90	900
20	80	1,600
30	70	2,100
40	60	2,400
2×25 = 50	**50**	**2×1,250 = 2,500**
60	40	2,400
70	30	2,100
80	20	1,600
90	10	900
100	0	0

Cartel

cartel a group of firms acting in unison

if Pat and Pete collude and agree to act as a monopoly they would maximize profits by providing access to a total of 50 liters for a total profit of $2,500

the tension between colluding oligopolists arises because they have to agree on how to split the sales/profits and how to ensure that no one cheats on the mutual agreement by selling more than their quota and/or lowering their price

The Economics of Cooperation

Game Theory

game theory — the study of how people behave in strategic situations

🌎 — some real-world economic problems that are studied by game theorists are price wars, exploitation of common access resources, establishment of new technology, trade wars

⚖ — despite game theory being developed for the needs of economics it has also been adopted in political science, biology and other fields where strategic, self-interested behavior is an important feature of the phenomena under consideration

The Prisoners' Dilemma

prisoners' dilemma a particular "game" between two captured prisoners that illustrates why cooperation is difficult to maintain even when it is mutually beneficial

the police have enough evidence to convict Bonnie and Clyde of the minor crime of carrying an unregistered gun, so that each would spend a year in jail, and the police also suspect that the two criminals have committed a bank robbery together, but they lack hard evidence to convict them of this major crime so they need at least of them to confess it.

this is similar to a duopoly where the two choices are to collude (deny) or compete (confess)

The Prisoners' Dilemma

Bonnie's Decision \ Clyde's Decision	Deny	Confess
Deny	Clyde gets 2 years Bonnie gets 2 years	Clyde gets 1 year Bonnie gets 20 years
Confess	Clyde gets 20 years Bonnie gets 1 year	Clyde gets 10 years Bonnie gets 10 years

The Prisoners' Dilemma: Dominant Strategies

Bonnie's Decision \ Clyde's Decision	Deny	**Confess**
Deny	Bonnie gets 2 years Clyde gets 2 years	Bonnie gets 20 years Clyde gets 1 year
Confess	Bonnie gets 1 year Clyde gets 20 years	**Bonnie gets 10 years** **Clyde gets 10 years**

Dominant Strategy

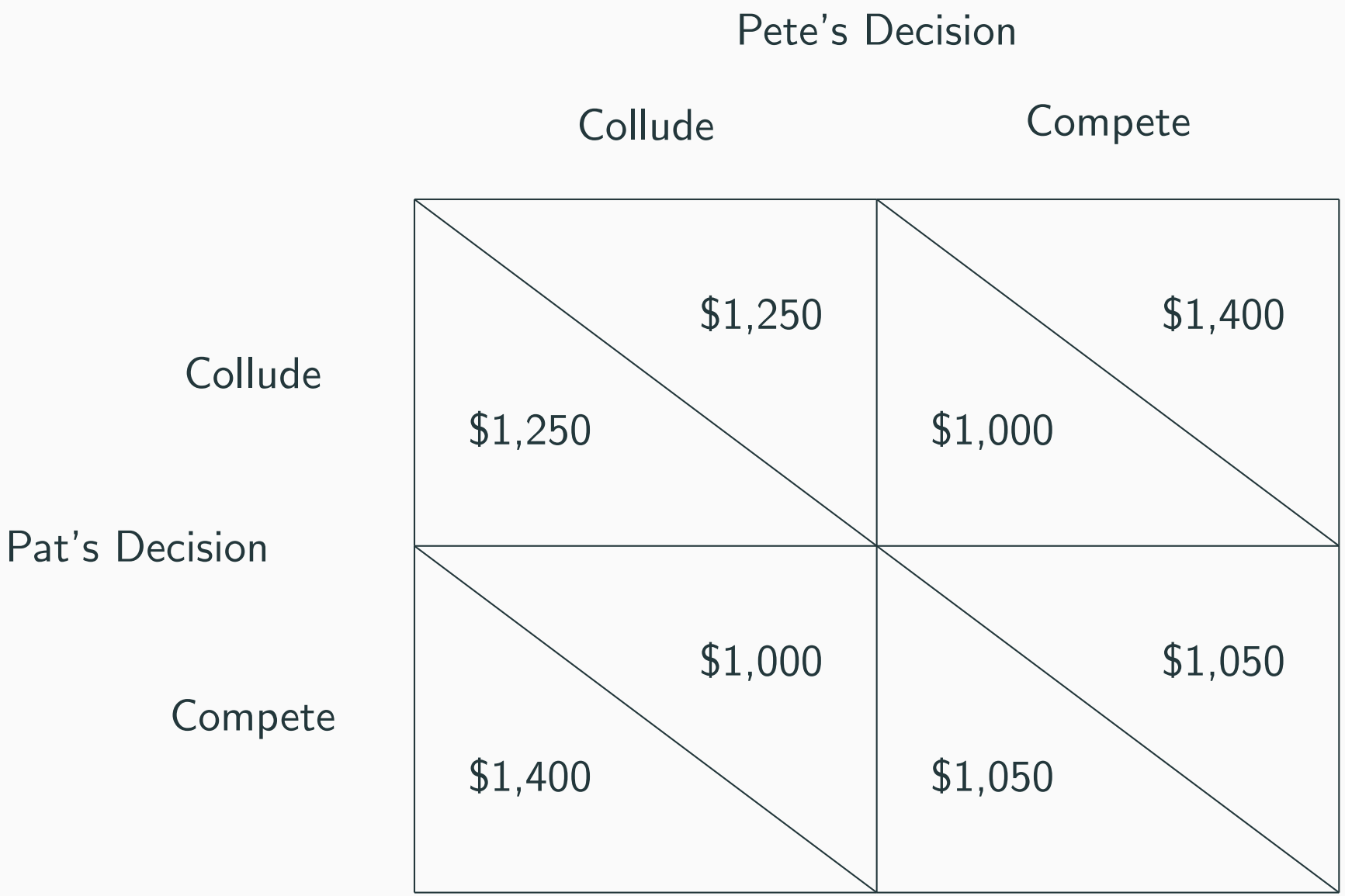
dominant strategy a strategy that is best for a player in a game regardless of the strategies chosen by the other players

🌎 the dominant strategy for Bonnie is to confess if he suspects that Clyde will deny and to confess if he suspects that Clyde will confess

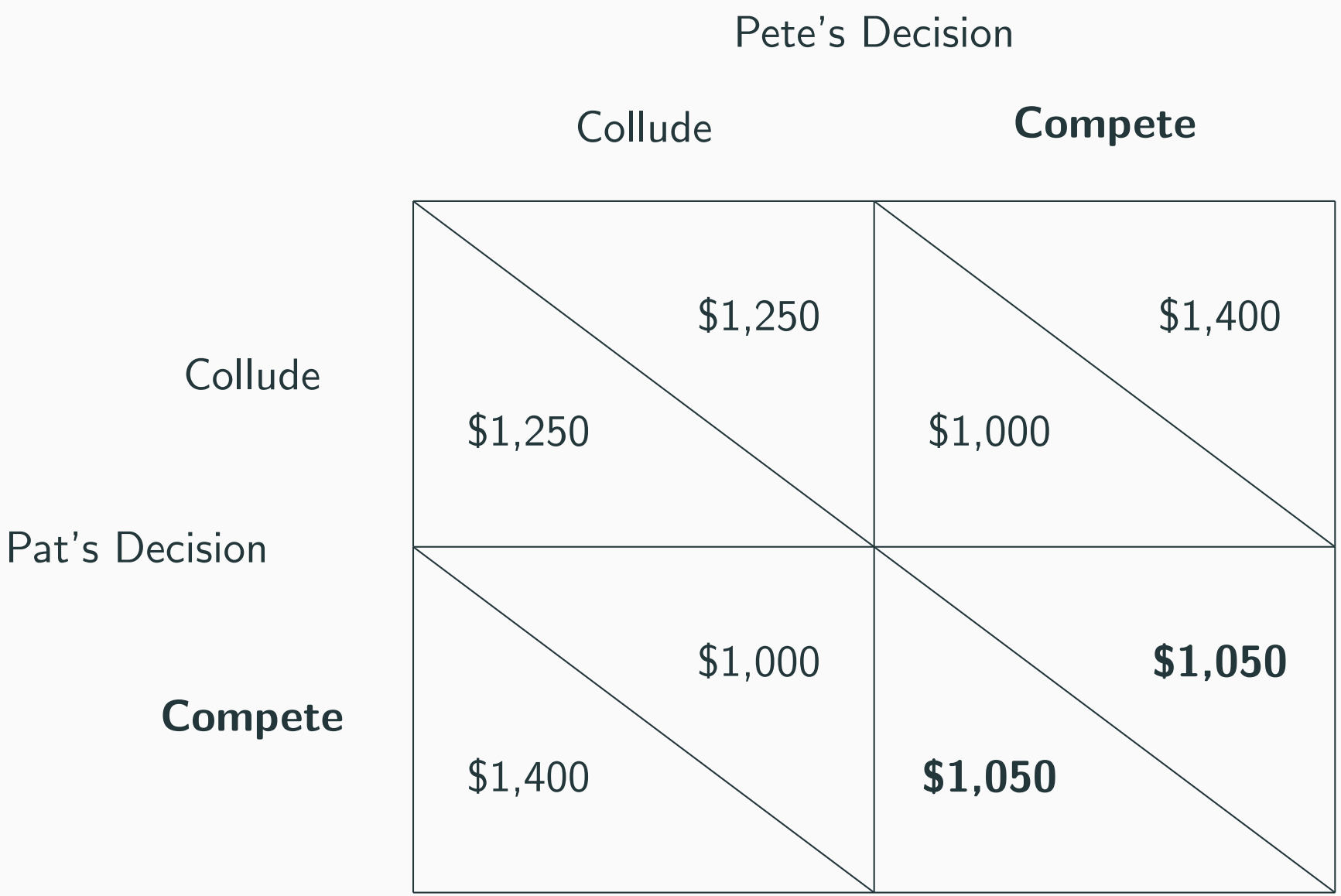
⚖️ this particular example assumes that both Bonnie and Clyde only get utility from years spent out of jail (no moral or other considerations) and that this game will only be played once (they will never see each other again)

The Application of Game Theory to Duopoly

Nash Equilibrium Profits in a Duopoly (Zero Cost Assumption)



Nash Equilibrium Profits in a Duopoly: Dominant Strategies



Equilibrium (Zero Marginal Cost Assumption)

Quantity (liters)	Price ($)	Total Profit ($)
0	100	0
10	90	900
20	80	1,600
30	70	2,100
40	60	2,400
50	50	2,500
60	40	2,400
$\mathbf{2 \times 35 = 70}$	**30**	$\mathbf{2 \times 1{,}050 = 2{,}100}$
80	20	1,600
90	10	900
100	0	0

Nash Equilibrium in a Duopoly (Zero Cost Assumption)

Nash equilbrium a situation in which economic actors interacting with one another each choose their best strategy given the strategies that all the other actors have chosen

🌎 if Pat and Pete each compete by choosing a strategy based on the chosen strategy of the other water provider, Pat would provide not 25 liters but 35 liters expecting to lower the market price to $40 but increase her own profit from $1,250 to $1,400

⚖ Pat's problem is that if Pete reasons the same way they will both end up worse off

Insights

The highly simplified analysis above illustrates the tension between self-interest and cooperation in an oligopolistic market structure. The tension between colluding to realize monopoly profits as a whole and competing to increase individual profit at the expense of the other participants results in the following outcomes:

- the output produced by oligopolistic firms is less than the output that would be produced in a more competitive market structure but more than the output that would be produced if the market was monopoly;
- the market price reached in an oligopolistic market is lower than the monopoly price but higher than a perfectly competitive price (the marginal cost of production).

How the Size of an Oligopoly Affects the Market Outcome?

At any time the participants in an oligopoly market have the option to increase output and in order to make the decision they have to weigh two conflicting effects on their profit:

The output effect: Because price is above marginal cost, selling one more unit of the product at the going price will raise the total profit.

The price effect: Raising production will increase the total amount sold, which will lower the market price, and hence the total profit from all the other units sold.

The more participants there are in the market, the more weight any individual participant would put on the output effect in their considerations!

Insights

Based on the arguments above, we can conclude that as the number of sellers in an oligopoly grows, an oligopolistic market increasingly resembles a competitive market:

- the price lowers to approach the marginal cost of production;
- the quantity produced increases to approach the socially efficient level of production.

These two conclusions provide yet another perspective on international trade — allowing free trade increases the number of producers from which each consumer can choose, increasing competition and world output while lowering prices closer to the marginal costs of production.

Public Policy and Oligopolies

Public Policies and Controversies

Policymakers use the antitrust laws to prevent oligopolies from engaging in behavior that reduces competition (*price fixing*).

However, the application of these laws can be controversial, because some behavior that can appear to reduce competition (*resale price maintenance, tying*) may in fact have legitimate business purposes.

Furthermore, sometimes the best way to achieve the most efficient outcome for society is to just enable more competition by removing trade barriers between countries.

Q&A Session!

Quick Quiz

Quick Question 1

The key feature of an oligopolistic market is that

A. each firm produces a different product from other firms.

B. each firm takes the market price as given.

C. a small number of firms are acting strategically.

D. a single firm chooses a point on the market demand curve.

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Quick Question 2

If an oligopolistic industry organizes itself as a cooperative cartel, it will produce a quantity of output ..... the competitive level and ..... the monopoly level.

A. less than; equal to

B. less than; more than

C. equal to; more than

D. more than; less than

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If an oligopoly does not cooperate and each firm chooses its own quantity, the industry will produce a quantity of output ..... the perfectly competitive level and ..... the monopoly level.

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Quick Question 4

As the number of firms in an oligopoly grows, the industry approaches a level of output ..... the perfectly competitive level and ..... the monopoly level.

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B. less than; more than

C. equal to; more than

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B. less than; more than

C. **equal to; more than**

D. more than; less than

Quick Question 5

The prisoners' dilemma is a two-person game illustrating that

A. even if the cooperative outcome is better than the Nash equilibrium for one person, it might be worse for the other.

B. even if cooperation is better than the Nash equilibrium, each person might have an incentive not to cooperate.

C. rational, self-interested individuals will naturally avoid the Nash equilibrium because it is worse for both of them.

D. the cooperative outcome could be worse for both people than the Nash equilibrium.

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Quick Question 6

Two people facing the prisoners' dilemma may cooperate if

A. they recognize that the Nash equilibrium is worse for both people than the cooperative equilibrium

B. each chooses the strategy that is best for herself, given what the other person is doing.

C. each realizes that the strategy she chooses is not known to the other until the outcome is realized.

D. they will play the game repeatedly and expect noncooperation to be met with future retaliation.

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Quick Question 7

The antitrust laws aim to

A. discourage firms from moving production facilities overseas.
B. facilitate cooperation among firms in oligopolistic industries.
C. prevent firms from acting in ways that reduce competition.
D. encourage mergers to take advantage of economies of scale.

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Quick Question 8

Antitrust enforcement is controversial mainly because

A. some business practices that seem anticompetitive may in fact have legitimate purposes.
B. cooperative domestic firms are best equipped to deal with international competitors.
C. excessive competition can drive some firms out of business, causing job losses.
D. vigorous enforcement can reduce business profitability, lowering shareholder value.

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Thank You!