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**CONCEPT:** CHARACTERISTICS OF OLIGOPOLY

● A market is an *oligopoly* when:

    □ Nature of Good: The goods for sale are _____

    □ Setting Price: The sellers are _____

        - There are _____ producers

        - Firms are _____ → One firm's price decision affects all firms in industry.

        - *Market power* – the ability of one person (or group) to have substantial influence on _____

    □ Entry and Exit: Entry to the market is _____ by *barriers to entry*.

    □ Example Product:

● Barriers to entry make sure that other firms cannot enter into an oligopoly market:

    □ Ownership of Key Resources

        - De Beers controlled substantially all diamond mines for a long period of time.

    □ Government Regulation

        - *Patents* give the owner the _____ right to produce a good for twenty years.

    □ Economies of Scale

        - An industry is an oligopoly when the quantity where costs are minimized satisfies a large part of demand.
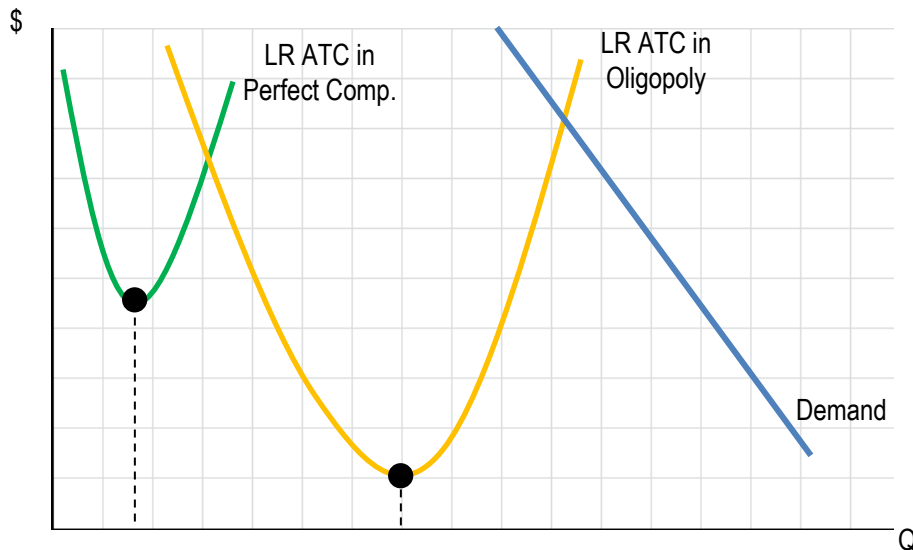
PRACTICE: One difference between oligopoly and monopolistic competition is that:

a) A monopolistically competitive industry has fewer firms
b) Fewer firms compete in oligopoly than in monopolistic competition
c) In monopolistic competition, products are identical
d) Monopolistic competition has barriers to entry

PRACTICE: An example of oligopoly is:

a) Wheat farming
b) The clothing industry
c) The restaurant industry
d) Cellular phone service

PRACTICE: A key feature of an oligopolistic market is that

a) Each firm produces a different product from other firms
b) A single firm chooses a point on the market demand curve
c) Each firm takes the market price as given
d) A small number of firms are acting strategically

PRACTICE: A major threat to long term profits exists when barriers to entry into an industry are high

a) True
b) False
c) None of the above

CONCEPT: ONE TIME GAMES AND THE PRISONER'S DILEMMA

● *Game Theory* – making decisions when the outcomes depend on the _____ with others

□ A *one-time game* gets played _____ time

The Prisoner's Dilemma - Bad Boy Benny and Evil Eddie were recently arrested after some casual B&E. The police do not have enough evidence to make a strong case against them, but can nail them for smaller crimes. After being separated into different cells, the police make each prisoner the same offer. "Right now, we can lock you up for a year. If you confess, we will let you go free and your partner will get 20 years. But if you both confess, you each get an 8-year sentence.

		Bad Boy Benny's Decision	
		Confess	Don't Confess
Evil Eddie's Decision	Confess		
	Don't Confess		

□ To make the "best decision," consider what you would do in response to each of your opponent's decisions.

   - A *dominant strategy* is your _____ strategy regardless of the other player's choice

       > Not every game has a dominant strategy!

   - The *Nash equilibrium* occurs where all players make their best choice given their competitor's choices.

       > Not necessarily the best outcome for all players!

□ In this game, both players would have been better off if they could cooperate.

   - *Collusion* is an agreement between players (i.e. firms) about their decisions (i.e. quantity/price)

   - A *cartel* is a group of colluding firms

       - Members of a cartel have the incentive to _____ to increase their profits

   - *Price leadership* - a form of collusion where one firm announces a price change and the industry follows.

● The easiest way to find dominant strategies and the Nash equilibrium is to use the _____ method.

1) Put a ✓ for each of Player One's best strategies

2) Put an ✗ for each of Player Two's best strategies

3) Analyze for your solution:

    a. Any row (or column) with two ✓ or two ✗ will be a *dominant strategy*.

    b. Any box with both a ✓ and an ✗ is a *Nash equilibrium*.

EXAMPLE:

		Player Two's Decision	
		A	**B**
Player One's Decision	**A**	Player One: $300 / Player Two: $500	Player One: $100 / Player Two: $400
	B	Player One: $400 / Player Two: $100	Player One: $200 / Player Two: $200

☐ Player One Dominant Strategy → _____

☐ Player Two Dominant Strategy → _____

☐ Nash Equilibrium   → _____

PRACTICE: Use the payoff matrix to answer the following questions:

		Target	
		Lower Prices	Keep Prices
Walmart	**Lower Prices**	Target: $5 million / Walmart: $5 million	Target: $1 million / Walmart: $30 million
	Keep Prices	Target: $30 million / Walmart: $1 million	Target: $20 million / Walmart: $20 million

Based on the information in the payoff matrix, which of the following is true?

a) This situation is not a prisoner's dilemma

b) If Walmart lowers its price, Target should keep its prices high

c) If Target lowers its price and Walmart does not, Target will earn $20 million economic profit

d) Both Walmart and Target would jointly be better off if they could each keep their prices high

The game above has:

a) A Nash equilibrium: both Walmart and Target keep prices high

b) A Nash equilibrium: both Walmart and Target lower prices

c) A Nash equilibrium: Target keeps prices high and Walmart lowers prices

d) No Nash equilibrium

**PRACTICE:** In a cartel, the incentive to cheat is significant because

a) Each firm has an incentive to decrease its own output

b) Each firm has an incentive to raise its price

c) Each firm has an incentive to expand its output

d) Each firm's marginal cost exceeds the price that the cartel sets

CONCEPT: GAME THEORY AND OLIGOPOLY PROFIT

● In oligopoly, a firm's profit is _____ on the output decisions of its competitors.

  □ Firms are said to be _____

EXAMPLE: Jack and Jill own the only wells in a small town. They have no cost of pumping water (for simplicity). The demand for water in their town is shown in the table below.

Quantity	Price	Total Revenue/Profit
0	120	0
10	110	1,100
20	100	2,000
30	90	2,700
40	80	3,200
50	70	3,500
60	60	3,600
70	50	3,500
80	40	3,200
90	30	2,700
100	20	2,000
110	10	1,100
120	0	0
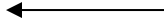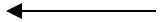
Both Produce 30 Gallons	**Jack Produces 30 ; Jill produces 40**	**Both Produce 40 Gallons**
Total Quantity = Price =	Total Quantity = Price =	Total Quantity = Price =
Jack's Profit = Jill's Profit =	Jack's Profit = Jill's Profit =	Jack's Profit = Jill's Profit =

Jack's Decision

		Produce 30 Gallons	Produce 40 Gallons
Jill's Decision	Produce 30 Gallons	Jack: _____ Jill: _____	Jack: _____ Jill: _____
	Produce 40 Gallons	Jack: _____ Jill: _____	Jack: _____ Jill: _____

CONCEPT: REPEATED GAMES

● In real life, oligopolies will need to play the game more than once (i.e. weekly prices)

    □ A *repeated game* is a one-time game that gets played over and over again

    □ Strategies in a repeated game differ from one-time games:

        - *Tit-for-tat strategy* – "I cooperate this period. If you don't cooperate, I won't cooperate next period."

            > The player's current choice depends on the opponent's previous choice

        - *Trigger strategy* – "I will cooperate until you don't cooperate. Then, I will never cooperate again."

		Jack's Decision	
		Produce 30 Gallons	Produce 40 Gallons
Jill's Decision	Produce 30 Gallons	Jack: $1,800 Jill: $1,800	Jack: $2,000 Jill: $1,500
	Produce 40 Gallons	Jack: $1,500 Jill: $2,000	Jack: $1,600 Jill: $1,600

PRACTICE: Jack employs a tit-for-tat strategy. If Jill cooperates this period, how many gallons will Jack produce?

    a) 30 gallons
    b) 40 gallons
    c) 70 gallons
    d) Not enough information

PRACTICE: Jack employs a tit-for-tat strategy. If Jill cheated last period, what will Jack's total profit equal this period?

    a) $1,500
    b) $1,600
    c) $1,800
    d) $2,000
    e) Not enough information
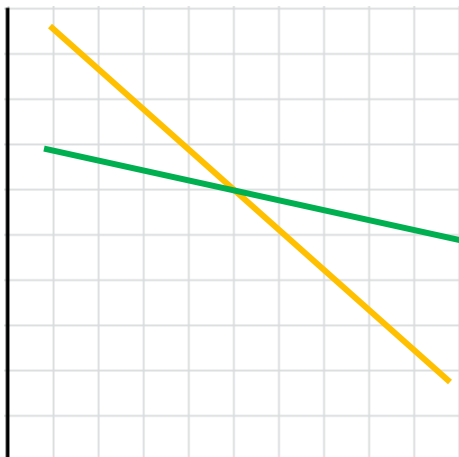
CONCEPT: KINKED DEMAND THEORY FOR OLIGOPOLIES

● The demand curve for oligopolies are not the same across industries because of two main reasons:

□ *Diversity of oligopolies* – the number of firms in an oligopoly affect the demand curve

□ *Interdependence* – the decisions of one firm affect the decisions of other firms in the oligopoly

> Firms cannot easily predict rival reactions with certainty, so they cannot estimate demand easily

> Profit maximizing price and output is not easily gauged

● The **kinked-demand theory** combines the two possible reactions of rival firms when a firm cuts prices

McDonny's, Burger Queen, and Windy's are rival firms producing Black Bean Burgers in an oligopolistic environment. If McDonny's changes their prices, there are two ways its competitors could react:
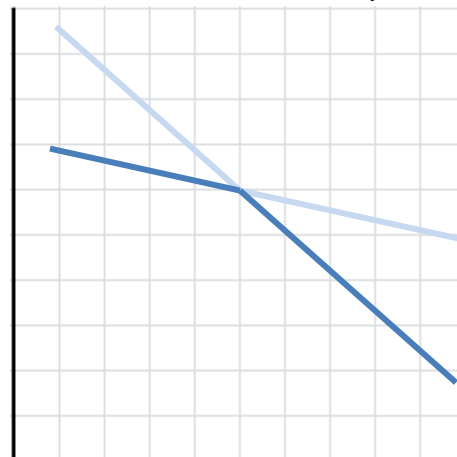
Rivals Match Price Changes → _____ *Demand Curve*	*Rivals Ignore Price Changes* → _____ *Demand Curve*
Price decrease → no advantage gained, Q slight increase	Price decrease → Gain advantage, Q large increase
Price increase → only lose sales to other industries	Price increase → Lose sales to Burger Queen & Windy's

Demand Curves Based on Rival Decisions

Kinked-Demand Theory

● Conclusions related to this model:

□ *Shifts in Marginal Cost* – a shift in MC between the two MR segments will _____ Price and Quantity

□ *Price Inflexibility* – prices are generally stable in oligopolies due to the demand and cost side effects of the kink

> Changing prices causes the worst case scenario for demand due to rival reactions

> Even if costs change dramatically, the firm may have no reason to change its prices

CONCEPT: FOUR MARKET MODEL SUMMARY

	Oligopoly
Number of Firms	
Examples	
Barriers to Entry	
Profit-Maximizing Quantity	
Long-Run Profitability	
Relation of Price (P=AR) and MR	
Relation of Price and MC	