SOLUTIONS TO TEXT PROBLEMS:

Quick Quizzes

1. Oligopoly is a market structure in which only a few sellers offer similar or identical products. Examples include the market for tennis balls and the world market for crude oil. Monopolistic competition is a market structure in which many firms sell products that are similar but not identical. Examples include the markets for novels, movies, CDs, and computer games.

2. If the members of an oligopoly could agree on a total quantity to produce, they would choose to produce the monopoly quantity, acting in collusion as if they were a monopoly.

   If the members of the oligopoly make production decisions individually, they produce a greater quantity than the monopoly quantity because self-interest leads them to produce more than the monopoly quantity.

3. The prisoners' dilemma is the story of two criminals suspected of committing a crime, in which the sentence that each receives depends both on his or her decision whether to confess or remain silent and on the decision made by the other. The following table shows the prisoners' choices:

		Bonnie's Decision	
		Confess	Remain Silent
Clyde's Decision	Confess	Bonnie gets 8 years Clyde gets 8 years	Bonnie gets 20 years Clyde goes free
	Remain Silent	Bonnie goes free Clyde gets 20 years	Bonnie gets 1 year Clyde gets 1 year

   The likely outcome is that both will confess, since that's a dominant strategy for both.

   The prisoners' dilemma teaches us that oligopolies have trouble maintaining monopoly profits because each oligopolist has an incentive to cheat.

4. It is illegal for businesses to make an agreement about reducing quantities or raising prices.

   Antitrust laws are controversial because it isn't always clear which kinds of behavior these laws should prohibit, such as resale price maintenance, predatory pricing, and tying.

Questions for Review

1. If a group of sellers could form a cartel, they would try to set quantity and price like a monopolist. They would set quantity at the point where marginal revenue equals marginal cost, and set price at the corresponding point on the demand curve.

2. Firms in an oligopoly produce a quantity of output greater than the level produced by monopoly at a price lower than the monopoly price.

3. Firms in an oligopoly produce a quantity of output less than the level produced by a perfectly

competitive market at a price greater than the perfectly competitive price.

4. As the number of sellers in an oligopoly grows larger, an oligopolistic market looks more and more like a competitive market. The price approaches marginal cost, and the quantity produced approaches the socially efficient level.

5. The prisoners' dilemma is a game between two people or firms that illustrates why it is difficult for opponents to cooperate even when cooperation would make them all better off. Each person or firm has a great incentive to cheat on any cooperative agreement to make himself or itself better off.

6. The arms race, advertising, and common resources are some examples of how the prisoners' dilemma helps explain behavior. In the arms race during the Cold War, the United States and the Soviet Union couldn't agree on arms reductions because each was fearful that after cooperating for a while, the other country would cheat. In advertising, two companies would be better off if neither advertised, but each is fearful that if it doesn't advertise, the other company will. When two companies share a common resource, they would be better off sharing it. But fearful that the other company will use more of the common resource, each company ends up overusing it.

7. Antitrust laws prohibit firms from trying to monopolize a market. They are used to prevent mergers that would lead to excessive market power in any firm and to keep oligopolists from acting together in ways that would make the market less competitive.

8. Resale price maintenance occurs when a wholesaler sets a minimum price that retailers can charge. This might seem to be anticompetitive because it prevents retailers from competing on price. But that is doubtful because: (1) if the wholesaler has market power, it can exercise such power through the wholesale price; (2) wholesalers have no incentive to discourage competition among retailers since doing so reduces the quantity sold; and (3) maintaining a minimum price may be valuable so retailers will provide customers with good service.

Problems and Applications

1. a. OPEC members were trying to reach an agreement to cut production so they could raise the price.

   b. They were unable to agree on cutting production because each country has an incentive to cheat on any agreement. The turmoil is a decline in the price of oil because of increased production.

   c. OPEC would like Norway and Britain to join their cartel so they could act like a monopoly.

2. a. If there were many suppliers of diamonds, price would equal marginal cost ($1,000), so the quantity would be 12,000.

   b. With only one supplier of diamonds, quantity would be set where marginal cost equals marginal revenue. The following table derives marginal revenue:

Price (thousands of dollars)	Quantity (thousands)	Total Revenue (millions of dollars)	Marginal Revenue (millions of dollars)
8	5	40	----
7	6	42	2

6	7	42	0
5	8	40	–2
4	9	36	–4
3	10	30	–6
2	11	22	–8
1	12	12	–10

With marginal cost of $1,000 per diamond, or $1 million per thousand diamonds, the monopoly will maximize profits at a price of $7,000 and a quantity of 6,000. Additional production beyond this point would lead to a situation where marginal revenue is lower than marginal cost.

c. If Russia and South Africa formed a cartel, they would set price and quantity like a monopolist, so the price would be $7,000 and the quantity would be 6,000. If they split the market evenly, they would share total revenue of $42 million and costs of $6 million, for a total profit of $36 million. So each would produce 3,000 diamonds and get a profit of $18 million. If Russia produced 3,000 diamonds and South Africa produced 4,000, the price would decline to $6,000. South Africa's revenue would rise to $24 million, costs would be $4 million, so profits would be $20 million, which is an increase of $2 million.

d. Cartel agreements are often not successful because one party has a strong incentive to cheat to make more profit. In this case, each could increase profit by $2 million by producing an extra thousand diamonds. However, if both countries did this, profits would decline for both of them.

3. a. Buyers who are oligopolists try to decrease the prices of goods they buy.

b. The owners of baseball teams would like to keep players' salaries low. This goal is difficult to achieve because each team has an incentive to cheat on any agreement, since they will be able to attract better players by offering higher salaries.

c. The salary cap would have formalized the collusion on salaries and helped to prevent any team from cheating.

4. Many answers are possible, such as picking which movie to see with your friend or negotiating the price of a car. The common link among all the activities is that there are just a few people involved who act strategically.

5. a. If Mexico imposes low tariffs, then the United States is better off with high tariffs, since it gets $30 billion with high tariffs and only $25 billion with low tariffs. If Mexico imposes high tariffs, then the United States is better off with high tariffs, since it gets $20 billion with high tariffs and only $10 billion with low tariffs. So the United States has a dominant strategy of high tariffs.

If the United States imposes low tariffs, then Mexico is better off with high tariffs, since it gets $30 billion with high tariffs and only $25 billion with low tariffs. If the United States imposes high tariffs, then Mexico is better off with high tariffs, since it gets $20 billion with high tariffs and only $10 billion with low tariffs. So Mexico has a dominant strategy of high tariffs.

b. A Nash equilibrium is a situation in which economic actors interacting with one another each choose their best strategy given the strategies others have chosen. The Nash

equilibrium in this case is for each country to have high tariffs.

c. The NAFTA agreement represents cooperation between the two countries. Each country reduces tariffs and both are better off as a result.

d. The payoffs in the upper left and lower right parts of the box do reflect a nation's welfare. Trade is beneficial and tariffs are a barrier to trade. However, the payoffs in the upper right and lower left parts of the box are not valid. A tariff hurts domestic consumers and helps domestic producers, but total surplus declines, as we saw in Chapter 9. So it would be more accurate for these two areas of the box to show that *both* countries' welfare will decline if they imposed high tariffs, whether or not the other country had high or low tariffs.

6. a. Dropping the letter grade by two letters (e.g., A to C) if you have no fun gives the payoffs shown in this table:

		Your Decision	
		Work	Shirk
Classmate's Decision	Work	You get a C Classmate gets a C	You get a B Classmate gets a D
	Shirk	You get a D Classmate gets a B	You get a D Classmate gets a D

b. The likely outcome is that both of you will shirk. If your classmate works, you're better off shirking, because you would rather have an overall B (a B grade and fun) then an overall C (an A grade and no fun). If your classmate shirks, you are indifferent between working for an overall D (a B grade with no fun) and shirking for an overall D (a D grade and fun). So your dominant strategy is to shirk. Your classmate faces the same payoffs, so will also shirk. But if you are likely to work with the same person again, you have a greater incentive to work, so that your classmate will work, so you will both be better off. In repeated games, cooperation is more likely.

7. Even though the ban on cigarette advertising increased the profits of cigarette companies, it was good public policy because it reduced the quantity of cigarette consumption. Since cigarette consumption imposes an externality because of its health costs, the reduction in quantity is beneficial.

8. a. The decision box for this game is:

		Braniff's Decision	
		Low Price	High Price
American's Decision	Low Price	Low profits for Braniff Low profits for American	Very low profits for Braniff High Profits for American
	High Price	High profits for Braniff Very low profits for American	Medium profits for Braniff Medium profits for American

b. If Braniff sets a low price, American will set a low price. If Braniff sets a high price,

American will set a low price. So American has a dominant strategy to set a low price.

If American sets a low price, Braniff will set a low price. If American sets a high price, Braniff will set a low price. So Braniff has a dominant strategy to set a low price.

Since both have a dominant strategy to set a low price, the Nash equilibrium is for both to set a low price.

c. A better outcome would be for both airlines to set a high price; then they would both get higher profits. But that outcome could only be achieved by cooperation (collusion). If that happened, consumers would lose because prices would be higher and quantity would be lower.

9. a. If Jones has 10 cows and Smith has 10, for a total of 20 cows, each cow produces $4,000 of milk. Since a cow costs $1,000, profits would be $3,000 per cow, or $30,000 for each farmer.

If one farmer had 10 cows and the other farmer had 20 cows, for a total of 30 cows, each cow produces $3,000 of milk. Profits per cow would be $2,000, so the farmer with 10 cows makes $20,000; the farmer with 20 cows makes $40,000.

If both farmers have 20 cows, for a total of 40 cows, each cow produces $2,000 of milk. Profit per cow is $1,000, so each farmer's profit is $20,000. The results are shown in the table:

		Jones' Decision	
		10 cows	20 cows
Smith's Decision	10 cows	$30,000 profit for Jones $30,000 profit for Smith	$40,000 profit for Jones $20,000 profit for Smith
	20 cows	$20,000 profit for Jones $40,000 profit for Smith	$20,000 profit for Jones $20,000 profit for Smith

b. If Jones had 10 cows, Smith would want 20 cows. If Jones had 20 cows, Smith would be indifferent (get the same profit) if he had 10 or 20 cows. So Smith has a dominant strategy of having 20 cows.

If Smith had 10 cows, Jones would want 20 cows. If Smith had 20 cows, Jones would be indifferent (get the same profit) if he had 10 or 20 cows. So Jones has a dominant strategy of having 20 cows.

The Nash equilibrium is for each farmer to have 20 cows, since that is the dominant strategy for each. They each make profits of $20,000. But they would both be better off if they cooperated and each had only 10 cows; then profit would be $30,000 each.

c. The problem illustrates how a common field may be overused, reducing the profits of producers. Since people tend to overuse common fields, it is more efficient for people to own their own portion of the field. Thus, over time, common fields have been divided up and owned privately.

10. Little Kona should not believe this threat from Big Brew because it is not in Big Brew's interest to

carry out the threat. If Little Kona enters, Big Brew can set a high price, in which case it makes $3 million, or Big Brew can set a low price, in which case it makes $1 million. Thus the threat is an empty one, which Little Kona should ignore; Little Kona should enter the market.

11. Neither player has a dominant strategy in this game. Jeff should hit left if Steve guesses right and Jeff should hit right if Steve guesses left. Steve should guess left if Jeff hits left and Steve should guess right if Jeff hits right. Thus, if Jeff stuck with a particular strategy (left or right), Steve would be able to guess it easily after a few points. A better strategy for Jeff is to randomly choose whether to hit the ball left or right, sometimes hitting left and other times hitting right.