Chapter 3

MARKETS, DEMAND AND SUPPLY, AND THE PRICE SYSTEM

FUNDAMENTAL QUESTIONS

1. What is a market?

A **market** is a place or service that allows buyers and sellers to exchange goods and services. A market may be a specific place, but the exchange of a particular good or service may take place at many different locations. Market transactions may involve the use of money or **barter.** In all markets, goods and services are exchanged and prices are determined.

2. What is demand?

Demand is the quantity of goods and services that consumers are willing and able to buy at every possible price during a specific period of time, all other things being equal. People often confuse demand with quantity demanded. Demand refers to a list of prices and corresponding quantities. **Quantity demanded** is the amount of a good or service that people are willing and able to buy at *one* particular price. It is correct to say, "If the price of a hair dryer is $15, the *quantity demanded* is 20." It is not correct to say, "If the price of a hair dryer is $15, the *demand* is 20."

The **law of demand** states that as the price of a good decreases, people buy more (and vice versa). That's why stores have sales to get rid of merchandise they can't sell: they know that if they lower the price, people will buy more.

When economists construct a **demand schedule,** they hold everything except the price of the good constant and determine the quantity consumers will buy at all the possible prices. However, things other than price affect how much of a good or service people are willing to buy. These other **determinants of demand** are income, tastes, prices of related goods or services, consumers' expectations, and number of buyers. When one of these determinants of demand changes, the whole demand schedule changes.

Economists take seriously the adage "A picture is worth a thousand words," so they draw pictures of demand schedules. These pictures are called **demand curves.** Price is put on the vertical axis and quantity on the horizontal axis. Demand curves slope down from left to right. When one of the determinants of demand changes, the demand curve shifts to the left or the right. Increases in demand shift the curve to the right, and decreases in demand shift the curve to the left. A change in the price of a good or service does not shift the demand curve for that good or service but instead is represented by a movement from one point to another along the same curve.

3. What is supply?

Supply is the quantity of a good or service that producers are willing and able to offer at each possible price during a specific period of time, all other things being equal. People often confuse supply with quantity supplied. Supply refers to a list of prices and corresponding quantities. **Quantity supplied** is the amount of a good or service offered for sale at *one* particular price. It is correct to say, "If the price of a hair dryer is $15, the *quantity supplied* will be 10." It is not correct to say, "If the price of a hair dryer is $15, the *supply* is 10."

The **law of supply** states that as the price of a good increases, producers will offer more for sale (and vice versa). That's why people offer a seller a higher price for the product when there is a shortage: they know the higher price will entice the producer to produce more.

When economists construct a **supply schedule**, they hold everything except the price of the good constant and determine the quantity producers will offer for sale at all the possible prices. However, things other than price affect how much of a good or service producers are willing to supply. These other **determinants of supply** are prices of resources, technology and **productivity,** expectations of producers, number of producers, and prices of related goods or services. When one of these determinants of supply changes, the whole supply schedule changes.

A picture of a supply schedule is called a **supply curve.** Again price goes on the vertical axis and quantity on the horizontal axis. Supply curves slope up from left to right. When one of the five determinants of supply changes, the supply curve shifts to the left or the right. Increases in supply shift the curve to the right; decreases in supply shift the curve to the left. A change in the price of a good or service does not shift the supply curve for that good or service but instead is represented by a movement from one point to another along the same curve.

4. How is price determined by demand and supply?

The price of a good or service changes until the equilibrium price is reached. **Equilibrium** is the point at which the quantity demanded equals the quantity supplied at a particular price. At prices above the equilibrium price, the quantity supplied is greater than the quantity demanded, so a **surplus** develops. Sellers must lower their prices to get rid of the goods and services that accumulate. At prices below the equilibrium price, the quantity demanded is greater than the quantity supplied, and a **shortage** develops. Sellers see the goods and services quickly disappear and realize they could have asked a higher price. The price goes up until the shortage disappears. The price continues to adjust until the quantity demanded and the quantity supplied are equal.

5. What causes price to change?

Price may change when demand, supply, or both change. A change in demand causes price to change in the same direction: an increase in demand causes price to increase. A change in supply causes price to change in the opposite direction: an increase in supply causes price to decrease. If demand and supply both change, the direction of the change in price depends on the relative size of the changes in demand and supply. For example, if demand and supply both increase but the demand change is larger, price will increase: it will act as if the only change had been a change in demand. If demand and supply both increase but the supply change is larger, price will decrease: it will act as if the only change had been a change in supply.

6. What happens when price is not allowed to change with market forces?

When price is not allowed to change, the market can't reach equilibrium. If a price ceiling is set that is below the market equilibrium price, a shortage will exist and will stay in existence as long as the ceiling price is maintained. Similarly, if a price floor is set that is above the equilibrium price, a surplus will exist.

Key Terms

market
barter
double coincidence of wants
transaction costs
relative price
demand
quantity demanded
law of demand
determinants of demand
demand schedule
demand curve
normal good
inferior good
substitute goods
complementary goods
exchange rate
supply
quantity supplied
law of supply
determinants of supply
supply schedule
supply curve
productivity
equilibrium
disequilibrium
surplus
shortage
price floor
price ceiling

Quick-Check Quiz

Section 1: Markets

1. A double coincidence of wants exists when
   a. A and B want the same good or service.
   b. A has what B wants.
   c. A has what B wants and B has what A wants.
   d. A has what B and C want.
   e. A has what C wants and B has what A wants.

2. Which of the following allocation schemes provides incentives for quantities of scarce goods to increase?
   a. first-come, first-served
   b. government scheme
   c. market system
   d. random allocation
   e. allocation of the good by members of the clergy on the basis of perceived need

3. In Mongoverna this year, apples cost $.50 each and oranges cost $.35 each. Suppose that next year, inflation runs rampant in Mongoverna. The price of apples increases to $1 each, and the price of oranges increases to $.70 each. Which of the following statements is true?
   a. The relative price of an apple has not changed.
   b. The relative price of an orange has changed.
   c. The absolute price of an apple has not changed.
   d. The absolute price of an orange has not changed.
   e. Both c and d are correct.

4. Which of the following statements is true?
   a. The transaction costs of finding a double coincidence of wants in order to barter are usually quite low.
   b. Money reduces transaction costs.
   c. People base economic decisions only on transaction costs.
   d. If all money prices doubled, relative prices would change.
   e. A double coincidence of wants is necessary to conduct money transactions.

5. If the price of a T-shirt is $12 and the price of a pair of designer jeans is $66, the relative price of a pair of designer jeans is
   a. $5^1/_2$ T-shirts.
   b. $^2/_{11}$ T-shirt.
   c. $5^1/_2$ jeans.
   d. $^2/_{11}$ jeans.
   e. $66.

Section 2: Demand

1. Which of the following would *not* cause a decrease in the demand for bananas?
   a. Reports surface that bananas are infected with a deadly virus.
   b. Consumers' incomes drop.
   c. The price of bananas rises.
   d. A deadly virus kills monkeys in zoos across the United States.
   e. Consumers expect the price of bananas to decrease in the future.

2. Which of the following is a determinant of demand?
   a. the number of sellers
   b. the prices of complementary goods
   c. producers' expectations
   d. an increase in productivity
   e. a change in technology

3. Which of the following is *not* a determinant of demand?
   a. income
   b. tastes
   c. prices of resources
   d. prices of complements
   e. consumers' expectations about future prices

4. Which of the following statements is *true?*
   a. When income decreases, the demand for normal goods decreases and the demand for inferior goods increases.
   b. When income increases, the demand for normal goods decreases and the demand for inferior goods increases.
   c. When the price of a substitute decreases, the demand for normal goods decreases and the demand for inferior goods increases.
   d. When the price of a substitute increases, the demand for normal goods decreases and the demand for inferior goods increases.
   e. When the price of a complement decreases, the demand for normal goods decreases and the demand for inferior goods increases.

5. A decrease in quantity demanded could be caused by a(n)
   a. decrease in consumers' incomes.
   b. decrease in the price of a substitute good.
   c. increase in the price of a complementary good.
   d. decrease in the price of the good.
   e. increase in the price of the good.

6. A recent Wichita State University study analyzed the effects of anticipated 6,000-plus layoffs at Boeing, a major Wichita employer. As a result of the anticipated layoffs,
   a. the demand for goods and services in Wichita will increase.
   b. the demand for goods and services in Wichita will decrease.
   c. the demand for Boeing airplanes will decrease.
   d. the demand for goods and services in Wichita will shift to the right.
   e. a and d are both correct.

7. The law of demand states that as the price of a good
   a. rises, the quantity demanded falls.
   b. rises, the quantity supplied falls.
   c. rises, the quantity demanded rises.
   d. rises, the quantity supplied rises.
   e. falls, the quantity demanded falls.

8. Which of the following would cause an increase in the demand for eggs?
   a. The price of eggs drops.
   b. The price of bacon rises.
   c. A government report indicates that eating eggs three times a week increases the chances of having a heart attack.
   d. A decrease in the cost of chicken feed makes eggs less costly to produce.
   e. None of the above would increase the demand for eggs.

9. If the price of barley, an ingredient in beer, increases,
   a. the demand for beer will increase.
   b. the demand for beer will not change.
   c. the demand for beer will decrease.
   d. the quantity of beer demanded will increase.
   e. a and d are both correct.

10. A freeze in Peru causes the price of coffee to skyrocket. Which of the following will happen?
    a. The demand for coffee will increase, and the demand for tea will increase.
    b. The demand for coffee will increase, and the quantity demanded of tea will increase.
    c. The quantity demanded of coffee will increase, and the demand for tea will increase.
    d. The quantity demanded of coffee will increase, and the quantity demanded of tea will increase.
    e. The quantity demanded of coffee will decrease, and the demand for tea will increase.

Section 3: Supply

1. According to the law of supply, as the price of a good or service
   a. rises, the quantity supplied decreases.
   b. rises, the quantity supplied increases.
   c. rises, the quantity demanded increases.
   d. rises, the quantity demanded decreases.
   e. falls, the quantity supplied increases.

2. Which of the following is *not* a determinant of supply?
   a. prices of resources
   b. technology and productivity
   c. prices of complements
   d. producers' expectations
   e. the number of producers

3. Japanese producers of a type of microchip offered such low prices that U.S. producers of the chip were driven out of business. As the number of producers decreased,
   a. the market supply of microchips increased—that is, the supply curve shifted to the right.
   b. the market supply of microchips increased—that is, the supply curve shifted to the left. .
   c. the market supply of microchips decreased—that is, the supply curve shifted to the right.
   d. the market supply of microchips decreased—that is, the supply curve shifted to the left.
   e. there was no change in the supply of microchips (this event is represented by a movement from one point to another on the same supply curve).

4. Electronics firms can produce more than one type of good. Suppose that electronics firms are producing both military radios and microchips. A war breaks out, and the price of military radios skyrockets. The electronics firms throw more resources into making military radios and fewer resources into making microchips. Which of the statements below is true?
   a. The supply of microchips has decreased, and the quantity supplied of military radios has increased.
   b. The supply of microchips has decreased, and the supply of military radios has increased.
   c. The quantity supplied of microchips has decreased, and the supply of military radios has decreased.
   d. The quantity supplied of microchips has decreased, and the quantity supplied of military radios has decreased.
   e. There has been no change in the supply of microchips or in the supply of military radios.

5. Suppose that a change in technology makes cell phones cheaper to produce. Which of the following will happen?
   a. The supply curve will shift to the left.
   b. The supply curve will shift to the right.
   c. The supply of car phones will increase.
   d. The supply of car phones will decrease.
   e. Both b and c are correct.

6. Which of the following is a determinant of supply?
   a. income
   b. tastes
   c. number of buyers
   d. the price of the good or service
   e. the prices of resources

7. Suppose that automakers expect car prices to be lower in the future. What will happen now?
   a. Supply will increase.
   b. Supply will decrease.
   c. Supply will not change.
   d. Demand will increase.
   e. Demand will decrease.

8. Which of the following would *not* cause an increase in the supply of milk?
   a. an increase in the number of dairy farmers
   b. a change in technology that reduces the cost of milking cows
   c. a decrease in the price of cheese
   d. a decrease in the price of milk
   e. a decrease in the price of cow feed

9. Which of the following would *not* change the supply of beef?
   a. The U.S. government decides to give a subsidy to beef producers.
   b. An epidemic of cow flu renders many cattle unfit for slaughter.
   c. The price of fish increases.
   d. A new hormone makes cows fatter and they require less feed.
   e. Beef producers expect lower beef prices next year.

Section 4: Equilibrium: Putting Demand and Supply Together

1. If demand increases and supply does not change,
   a. equilibrium price and quantity increase.
   b. equilibrium price and quantity decrease.
   c. equilibrium price increases and equilibrium quantity decreases.
   d. equilibrium price decreases and equilibrium quantity increases.
   e. the demand curve shifts to the left.

2. If supply decreases and demand does not change,
   a. equilibrium price and quantity increase.
   b. equilibrium price and quantity decrease.
   c. equilibrium price increases and equilibrium quantity decreases.
   d. equilibrium price decreases and equilibrium quantity increases.
   e. the supply curve shifts to the right.

3. Prices above the equilibrium price cause a(n)
   a. shortage to develop and drive prices up.
   b. shortage to develop and drive prices down.
   c. surplus to develop and drive prices up.
   d. surplus to develop and drive prices down.
   e. increase in supply.

4. Prices below the equilibrium price cause a(n)
   a. shortage to develop and drive prices up.
   b. shortage to develop and drive prices down.
   c. surplus to develop and drive prices up.
   d. surplus to develop and drive prices down.
   e. increase in demand.

5. Utility regulators in some states are considering forcing operators of coal-fired generators to be responsible for cleaning up air and water pollution resulting from the generators. Utilities in these states currently do not pay the costs of cleanup. If this law goes into effect,
   a. demand for electricity will increase, and price and quantity will increase.
   b. demand for electricity will decrease, and price and quantity will decrease.
   c. the supply of electricity will decrease, and price and quantity will decrease.
   d. the supply of electricity will increase, price will decrease, and quantity will decrease.
   e. the supply of electricity will decrease, price will increase, and quantity will decrease.

6. Medical research from South Africa indicates that vitamin A may be useful in treating measles. If the research can be substantiated, the
   a. supply of vitamin A will increase, causing equilibrium price and quantity to increase.
   b. supply of vitamin A will increase, causing equilibrium price to fall and quantity to increase.
   c. demand for vitamin A will increase, causing equilibrium price and quantity to increase.
   d. demand for vitamin A will increase, causing equilibrium price to rise and quantity to fall.
   e. supply of vitamin A will increase, causing equilibrium price to rise and quantity to fall.

7. Since 1900, changes in technology have greatly reduced the costs of growing wheat. The population also has increased. If you know that the changes in technology had a greater effect than the increase in population, then since 1900 the
   a. price of wheat has increased and the quantity of wheat has decreased.
   b. price and quantity of wheat have increased.
   c. price and quantity of wheat have decreased.
   d. price of wheat has decreased and the quantity of wheat has increased.
   e. quantity of wheat has increased, and you haven't got the faintest idea what happened to the price.

8. Which of the following statements is *false*?
   a. Disequilibrium may persist in some markets because it is too costly to change prices rapidly.
   b. A ceiling price set higher than the equilibrium price will cause a shortage.
   c. Prices set by governments can be lower than equilibrium prices.
   d. Part of the cost of a restaurant meal is the opportunity cost of the time spent waiting for a table.
   e. All of the above are true.

Use the table below to answer questions 9 through 12.

Price	Quantity Demanded	Quantity Supplied
$0	24	0
1	20	2
2	16	4
3	12	6
4	8	8
5	4	10
6	0	12

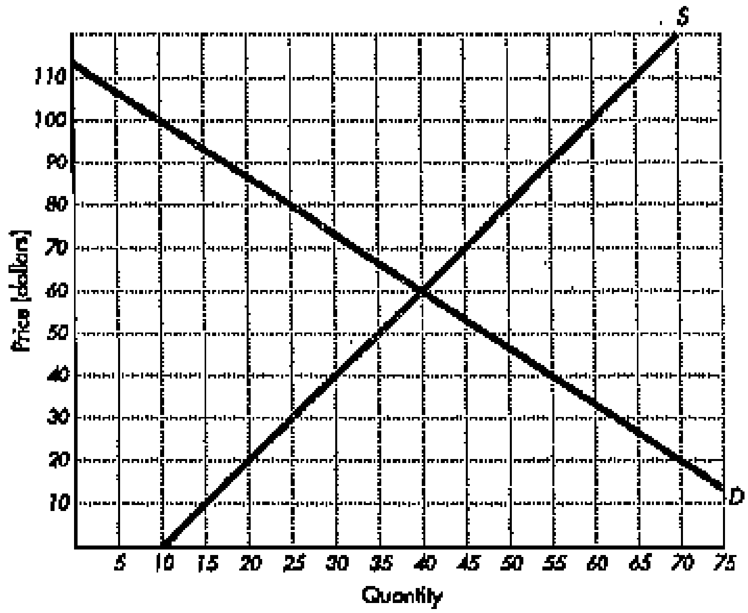
9. The equilibrium price is
   a. $1.
   b. $2.
   c. $3.
   d. $4.
   e. $5.

10. The equilibrium quantity is
   a. 2.
   b. 4.
   c. 6.
   d. 8.
   e. 10.

11. If the price is $2, a __________ of __________ units will develop, causing the price to __________.
   a. shortage; 12; increase
   b. shortage; 12; decrease
   c. surplus; 12; increase
   d. surplus; 12; decrease
   e surplus; 19; decrease

12. If the price is $5, a __________ of __________ units will develop, causing the price to __________.
   a. shortage; 6; increase
   b. shortage; 6; decrease
   c. surplus; 6; increase
   d. surplus; 6; decrease
   e. shortage; 12; increase

Use the graph below to answer questions 13 through 16.



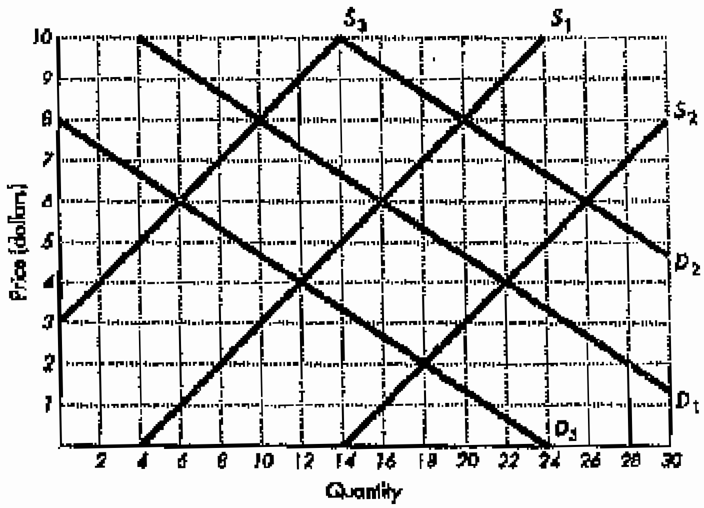
13. The equilibrium price is
    a. \$20.
    b. \$40.
    c. \$60.
    d. \$80.
    e. \$100.

14. The equilibrium quantity is
    a. 25.
    b. 30.
    c. 35.
    d. 40.
    e. 45.

15. A price of \$80 would cause a ___________ of ___________ units to develop, driving the price ___________.
    a. shortage; 6; up
    b. shortage; 25; up
    c. surplus; 6; down
    d. surplus; 25; down
    e. surplus; 25; up

16. A price of \$20 would result in a ___________ of ___________ units, driving the price ___________.
    a. shortage; 10; up
    b. shortage; 50; up
    c. surplus; 10; down
    d. surplus; 50; down
    e. shortage; 50; down

Use the graph below to answer questions 17 through 20. The original supply curve is S_1, and the original demand curve is D_1.



17. The original equilibrium price is __________, and the original equilibrium quantity is __________ units.
    a. \$6; 6
    b. \$4; 12
    c. \$8; 20
    d. \$6; 16
    e. \$8; 20

18. An increase in the price of a resource causes __________ to shift to __________. The new equilibrium price is __________, and the new equilibrium quantity is __________ units.
    a. demand; D_2; \$8; 20
    b. demand; D_3; \$4; 12
    c. supply; S_2; \$4; 22
    d. supply; S_3; \$8; 10
    e. supply; S_3; \$10; 14

19. Begin at the original equilibrium position at the intersection of D_1 and S_1. Now a decrease in the price of a complementary good causes __________ to shift to __________. The new equilibrium price is __________, and the new equilibrium quantity is __________ units.
    a. demand; D_2; \$8; 20
    b. demand; D_3; \$4; 12
    c. supply; S_2; \$4; 22
    d. supply; S_3; \$8; 10
    e. supply; S_3; \$10; 14

20. Begin at the original equilibrium position at the intersection of D_1 and S_1. An increase in income occurs at the same time as a change in technology decreases the costs of production. The new equilibrium price will be __________, and the new equilibrium quantity will be __________ units.
    a. \$6; 26
    b. \$4; 22
    c. \$8; 20
    d. \$10; 14
    e. \$6; 8

21. An increase in demand
    a. shifts the demand curve to the left.
    b. causes an increase in equilibrium price.
    c. causes a decrease in equilibrium price.
    d. causes a decrease in equilibrium quantity.
    e. does not affect equilibrium quantity.

22. When demand decreases,
    a. price and quantity increase.
    b. price and quantity decrease.
    c. price increases and quantity decreases.
    d. price decreases and quantity increases.
    e. supply decreases.

23. When supply decreases,
    a. the supply curve shifts to the right.
    b. equilibrium price and equilibrium quantity both increase.
    c. equilibrium price and equilibrium quantity both decrease.
    d. equilibrium price decreases and equilibrium quantity increases.
    e. equilibrium price increases and equilibrium quantity decreases.

24. A pair of Reebok shoes costs \$50 in the United States and £30 in the United Kingdom. Which of the following statements is true?
    a. \$1 is equivalent to £.60.
    b. \$1 is equivalent to £1.67.
    c. £1 is equivalent to \$.60.
    d. Reebok shoes are more expensive in the United States.
    e. Reebok shoes are more expensive in the United Kingdom.

25. One morning you pick up the newspaper and see these three headlines:

    New oil discoveries mean low gasoline prices for next ten years
    New technology lowers the cost of making computer chips
    New pollution reductions raise costs of making carpet

    Which of the following is a predictable reaction to these headlines?
    a. The demand for gas-guzzling large SUVs increases, raising their market price and decreasing their quantity.
    b. The demand for computers decreases, raising their market price and quantity.
    c. The supply of carpet increases, raising its market price and quantity.
    d. The supply of computer chips decreases, raising their market price and quantity.
    e. The demand for gas-guzzling large SUVs increases, raising their market price and quantity.

Practice Questions and Problems

Section 1: Markets

1. A(n) __________ is a place or service that enables buyers and sellers to exchange goods and services.
2. The exchange of goods and services directly, without money, is called __________.
3. In a barter economy, trade cannot occur unless there is a(n) __________ of wants.
4. __________ prices are a measure of opportunity costs.
5. __________ occurs when an auto mechanic tunes up an accountant's car in exchange for the accountant's doing the mechanic's income taxes.
6. The costs involved in making a barter exchange are called __________ costs.
7. The price established when an exchange occurs is called the __________ price.
8. If all prices double, relative prices __________ (do, do not) change.

Section 2: Demand

1. __________ refers to the quantities of a well-defined commodity that consumers are willing and able to buy at every possible price during a given time period.
2. According to the law of demand, if you __________ your price, people will buy more.
3. List five determinants of demand.

    ____

    ____

    ____

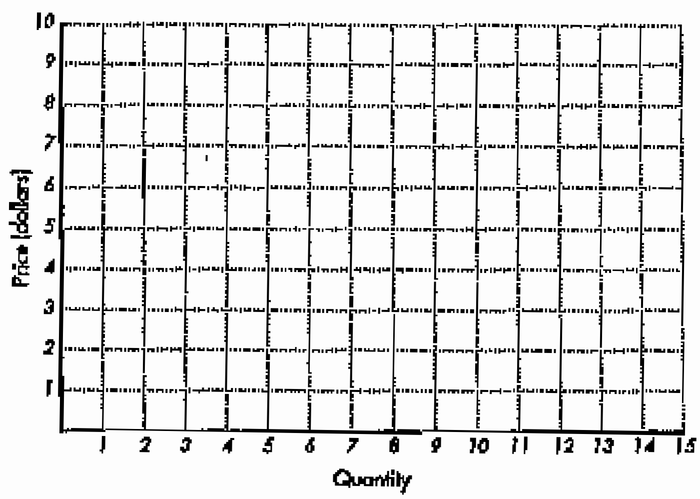
    ____

    ____

4. Demand curves slope down because of the __________ relationship between price and __________.
5. Suppose that an increase in the price of Nohr Cola causes you to switch to Sooby Cola. You therefore buy less Nohr Cola. Sooby Cola is a(n) __________ for Nohr Cola.
6. The higher people's __________, the more goods they can purchase at any price.
7. A(n) __________ is a graph of a demand schedule.
8. __________ goods can be used in place of each other; these goods would not be consumed at the same time.
9. Goods that are used together are called __________ goods.
10. Dot, Diane, and Mardi are college students who share an apartment. Dot loves strawberries and buys them whenever they are available. Diane is a fair-weather strawberry eater: she only buys them if she thinks she is getting a good price. Mardi eats strawberries for their vitamin C content but isn't crazy about them. The table on the following page shows the individual demand schedules for Dot, Diane, and Mardi. Suppose that these three are the only consumers in the local market for strawberries. Add their individual demands to get the market demand schedule.

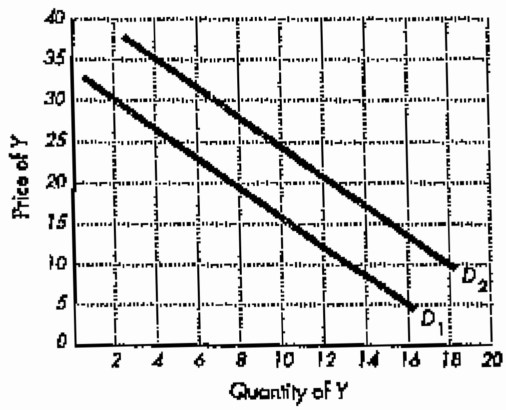
	Quantity			
Price per Quart	Dot	Diane	Mardi	Market
$0	6.00	4.00	2.00	______
1	5.00	3.50	1.50	______
2	4.00	3.00	1.00	______
3	3.25	2.00	0.75	______
4	2.00	1.50	0.50	______
5	1.25	0.50	0.25	______
6	0	0	0	______

Plot the market demand for strawberries on the graph below.

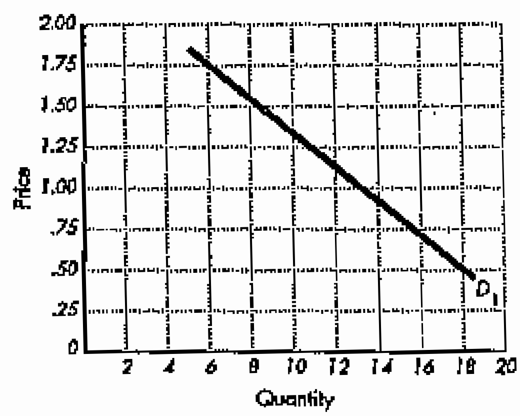


11. Suppose that the price of strawberries increases from $2 to $3 per quart. The increase in price would cause a decrease in the ____________ (demand, quantity demanded) of strawberries. Show the effect of this change in the price of strawberries on the graph above.
12. Suppose that Dot reads in the paper that eating strawberries increases the health of females. As a group, Dot and her friends decide to buy twice as many strawberries as they did before at any price. Plot the new market demand curve in the graph above, and label it D_2. This change in tastes has caused a(n) ____________ (increase, decrease) in ____________ (demand, quantity demanded).
13. An increase in income ____________ (increases, decreases) the ____________ (demand, quantity demanded) for haircuts.
14. Many Americans have decreased their consumption of beef and switched to chicken in the belief that eating chicken instead of beef lowers cholesterol. This change in tastes has ____________ (increased, decreased) the ____________ (demand, quantity demanded) for beef and ____________ (increased, decreased) the ____________ (demand, quantity demanded) for chicken.

15. In the graph below, the price of good X increased, causing the demand for good Y to change from D_1 to D_2. The demand for good Y __________ (increased, decreased). X and Y are __________ (substitutes, complements).



16. Mr. and Mrs. Gertsen are retiring next year and expect that their future income will be less than it is now. If D_1 is their current demand for bacon, show the effect of this expectation on the graph below. Label your new curve D_2. Demand for bacon has __________ (increased, decreased).



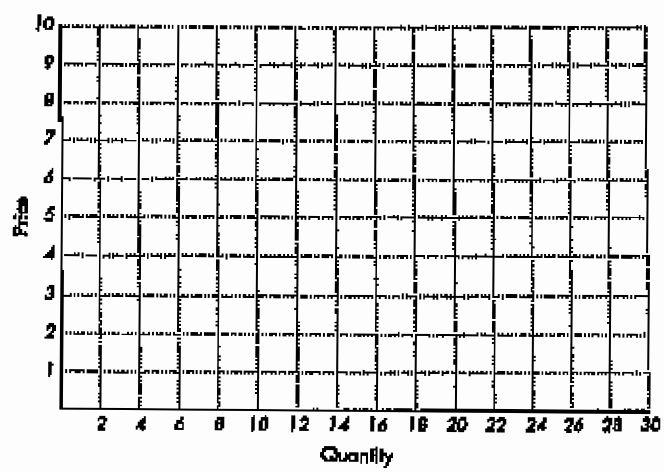
17. In the year 2020, one out of every four Americans is predicted to be over 65 years old. The demand for health-care facilities for the elderly will __________ (increase, not change, decrease).
18. A crisis in the Middle East causes people to expect the price of gasoline to increase in the future. The demand for gasoline today will __________ (increase, not change, decrease).
19. If the price of Pepsi increases, the demand for Coke and other substitutes will __________.

Section 3: Supply

1. __________ is the amount of a good or service that producers are willing and able to offer for sale at each possible price during a period of time.
2. According to the law of supply, as price __________, quantity supplied decreases.

3. A table or list of the prices and corresponding quantity supplied of a well-defined good or service is called a(n) __________.
4. A(n) __________ is a graph of a supply schedule.
5. Market supply curves have __________ slopes.
6. There are only two strawberry producers in the little town where Dot, Diane, and Mardi live. Their individual supply schedules are shown below. Add the individual supplies to get market supply, and then plot market supply (curve S_1) on the graph below.

	Quantity Supplied		
Price per Quart	Farmer Dave	Farmer Ruth	Market
$0	2	2	______
1	3	3	______
2	4	4	______
3	5	5	______
4	6	6	______
5	7	7	______
6	8	8	______



7. List the five determinants of supply.

____

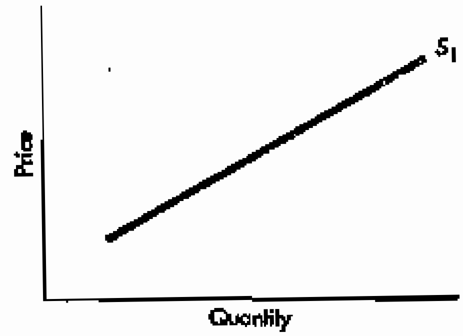
____

____

____

____

8. Suppose that a crisis in the Middle East cuts off the supply of oil from Saudi Arabia. If S_1 is the original market supply of oil, draw another supply curve, S_2, on the graph to show the effect of Saudi Arabia's departure from the market. The ___________ (quantity supplied, supply) has ___________ (increased, decreased).

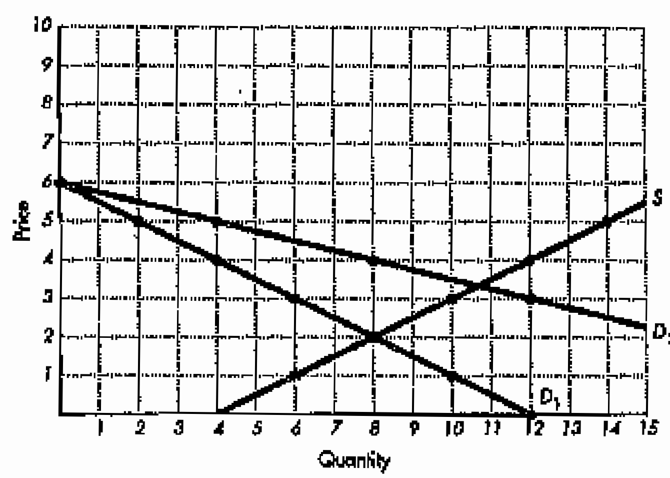


9. If the price of tomato sauce increases, the ___________ (supply, quantity supplied) of pizza will ___________ (increase, decrease).
10. ___________ is the quantity of output produced per unit of resource.
11. A new process for producing microchips is discovered that will decrease the cost of production by 10 percent. The supply of microchips will ___________ (increase, decrease, not change), which means the supply curve will ___________ (shift to the right, shift to the left, not change).
12. A paper manufacturer can produce notebook paper or wedding invitations. If the price of wedding invitations skyrockets, we can expect the supply of ___________ (notebook paper, wedding invitations) to ___________ (increase, decrease).
13. A real-estate developer who specializes in two-bedroom homes believes that the incomes of young couples will decline in the future. We can expect the supply of this realtor's two-bedroom homes to ___________ (increase, decrease).
14. Changes in quantity supplied are caused by changes in the ___________ of the good.

Section 4: Equilibrium: Putting Demand and Supply Together

1. The point at which the quantity demanded equals the quantity supplied at a particular price is known as the point of ___________.
2. Whenever the price is greater than the equilibrium price, a(n) ___________ arises.
3. A(n) ___________ arises when the quantity demanded is greater than the quantity supplied at a particular price.
4. Shortages lead to ___________ (increases, decreases) in price and quantity supplied and ___________ (increases, decreases) in quantity demanded.

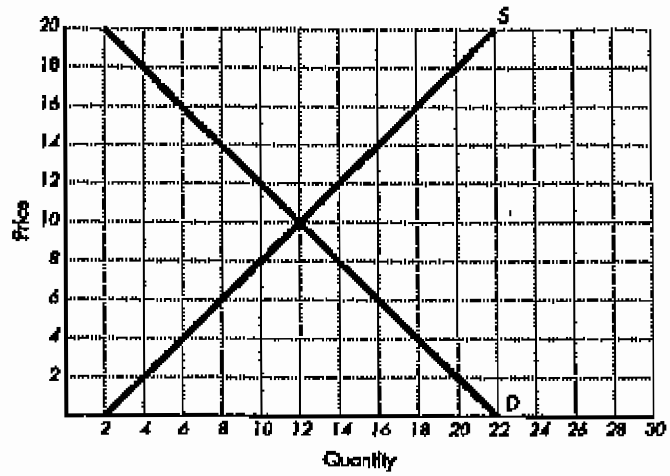
5. Surpluses lead to ___________ (increases, decreases) in price and quantity supplied and ___________ (increases, decreases) in quantity demanded.
6. The only goods that are not scarce are ___________ goods.
7. As long as supply does not change, a change in equilibrium price and quantity is in the ___________ (same, opposite) direction as a change in demand.
8. Balloon manufacturers are nervous about a children's movement that may affect their product. The children are lobbying state legislatures to ban launchings of more than ten balloons at a time, citing the danger that balloons can pose to wildlife. If the children are successful, we can expect the ___________ (demand for, supply of) balloons to ___________ (increase, decrease), causing the equilibrium price to ___________ and the equilibrium quantity to ___________.
9. If design changes in the construction of milk cartons cause the cost of production to decrease, we can expect the ___________ (demand for, supply of) cartons to ___________ (increase, decrease), the equilibrium price to ___________, and the equilibrium quantity to ___________.
10. A decrease in supply leads to a(n) ___________ in price and a(n) ___________ in quantity.
11. Remember Dot, Diane, and Mardi and the strawberry farmers Dave and Ruth? The local market for strawberries (before Dot read about the effects of strawberries on women's health) is reproduced in the graph below. The original demand is D_1 and the original supply is S. The equilibrium price is ___________, and the equilibrium quantity is ___________.



After Dot read the article on strawberries and health, the market demand curve shifted to D_2. The new equilibrium price is ___________, and the new equilibrium quantity is ___________. There was also a change in ___________ (supply, quantity supplied).

12. ___________ occurs when the quantity demanded and the quantity supplied are not equal.

13. The graph below shows the market for corn. The equilibrium price is ____________, and the equilibrium quantity is ____________.



If the price of corn is $14, the quantity demanded will be ____________, and the quantity supplied will be ____________. A(n) ____________ of ____________ units will develop, causing the price and quantity supplied to ____________ and the quantity demanded to ____________.

If the price is $4, the quantity demanded will be ____________, and the quantity supplied will be ____________. A(n) ____________ of ____________ units will develop, causing the price and quantity supplied to ____________ and the quantity demanded to ____________.

14. List three reasons why there can be excess supply or demand in a market.

____

____

____

Thinking About and Applying Markets, Demand and Supply, and the Price System

I. Changes in Demand

Indicate whether there is an increase or decrease in demand, an increase or decrease in quantity demanded, or no effect on demand. The market of interest is in italic.

1. *TV sets.* The number of producers of TV sets decreases. ____________
2. *Radios.* The price of radios goes up. ____________
3. *Cassette recorders.* The price of cassette recorders falls. ____________
4. *Coffee.* The price of tea falls. ____________

II. Changes in Supply

Indicate whether the supply curve would shift to the left or right in the following situations. If there is no effect, say so.

	Right	Left	No Effect
1. The number of producers of the product decreases.	________	________	________
2. Consumers expect higher prices in the future.	________	________	________
3. The price of the product goes up.	________	________	________
4. The cost of an input decreases.	________	________	________
5. Consumers' incomes fall.	________	________	________
6. A change in technology reduces the costs of producing the product.	________	________	________
7. A tariff is placed on the product.	________	________	________
8. The price of a substitute in production increases.	________	________	________
9. A tax on the product is increased.	________	________	________
10. The price of the product falls.	________	________	________

III. Distinguishing Changes in Demand from Changes in Supply

It is important that you be able to distinguish between factors that affect demand and factors that affect supply. Place a *D* next to items that are determinants of demand and an *S* next to items that affect supply.

________ 1. producers' expectations
________ 2. income
________ 3. changes in technology
________ 4. prices of substitutes in production
________ 5. prices of related goods
________ 6. number of sellers
________ 7. tastes
________ 8. prices of complements
________ 9. consumers' expectations
________ 10. number of buyers
________ 11. changes in productivity
________ 12. prices of resources
________ 13. prices of substitutes in consumption

IV. The Market for Battery-Operated Dancing Flowers

For each event on the following page, indicate whether it affects the demand or supply of battery-operated dancing flowers and the direction (increase or decrease) of the change. Also indicate what will happen to equilibrium price and quantity. Remember, the determinants of demand are income, tastes, prices of related goods or services, consumers' expectations, number of buyers, and exchange rates. The determinants of supply are prices of resources, changes in technology or productivity, producers' expectations, number of producers, and prices of related goods or services (goods that are substitutes in production).

1. There is a change in tastes toward battery-operated dancing gorillas.
2. The price of plastic falls.
3. A technological breakthrough makes it cheaper to produce plastic flowers.
4. Consumers' incomes rise.
5. The price of battery-operated dancing gorillas rises.
6. The price of plastic flowers skyrockets.
7. A fire destroys a major production facility for dancing flowers.
8. Consumers expect lower prices for dancing flowers in the future.

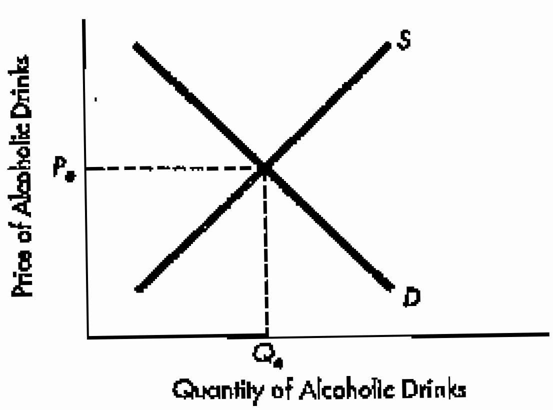
	Demand	Supply	Price	Quantity
1.	______	______	______	______
2.	______	______	______	______
3.	______	______	______	______
4.	______	______	______	______
5.	______	______	______	______
6.	______	______	______	______
7.	______	______	______	______
8.	______	______	______	______

V. Drinking and Cancer

The *Wichita Eagle* reported the results of a study that suggest that the anticancer benefit of eating lots of fruits and vegetables is lost if you wash them down with more than two drinks of alcohol.

As a result of this study, the __________ (demand, supply) for alcoholic drinks will __________ (increase, not change, decrease). The equilibrium price will __________ (increase, not change, decrease), and the equilibrium quantity will __________ (increase, not change, decrease).

Assume the market for alcoholic drinks was in equilibrium before the study, as shown below. Illustrate the effects of the research linking the loss of anticancer benefits with alcohol. Be sure your graph matches your answers above.



VI. Simultaneous Shifts in Demand and Supply: A Shortcut Approach

What do you do if events occur that shift both demand and supply at the same time? If you know the relative magnitudes of the shifts in demand and supply, you can predict both the equilibrium price and the equilibrium quantity. If you do not know the relative magnitudes of the shifts, you will be able to predict either equilibrium price or equilibrium quantity, but not both. Let's look at a quick way to do this.

Suppose demand and supply both increase. Look at what happens to price and quantity when you consider *only* an increase in demand:

	$D\uparrow$
Price	↑
Quantity	↑

Now add what happens to price and quantity when you consider *only* an increase in supply:

	$D\uparrow$	$S\uparrow$
Price	↑	↓
Quantity	↑	↑

When you look at the changes *together,* it's easy to see that the quantity increases but that the effect on price is uncertain. If the demand change is larger than the supply change, price increases. If the supply change is larger than the demand change, price decreases.

Let's try it again. Suppose demand increases and supply decreases. First look at what happens to price and quantity when you consider *only* an increase in demand:

	$D\uparrow$
Price	↑
Quantity	↑

Now add what happens to price and quantity when you consider *only* a decrease in supply:

	$D\uparrow$	$S\uparrow$
Price	↑	↑
Quantity	↑	↓

When you look at the changes together, can you see that the price increases but that the effect on quantity is uncertain? If the demand change is larger than the supply change, quantity increases. If the supply change is larger than the demand change, quantity decreases.

1. In the chart below, indicate a decrease in demand coupled with an increase in supply, then predict in what direction price and quantity will change.

	D	*S*
Price Quantity		

P ________, *Q* ________

2. Now try a decrease in demand coupled with a decrease in supply, then predict in what direction price and quantity will change.

	D	*S*
Price Quantity		

P ________, *Q* ________

Now let's try some more concrete examples.

3. We are analyzing the market for home computers. We foresee three main events coming up that will affect this market:
   a. Consumers' incomes are likely to increase.
   b. There will be an increase in the number of buyers as more schoolchildren become familiar with home computers in the classroom.
   c. We expect improvements in technology that will decrease the costs of production.

Use the chart below to determine what will happen to the equilibrium price and equilibrium quantity of home computers.

	D	*S*
Price Quantity		

P ________, *Q* ________

4. Suppose the cost of turkey food increases at the same time the price of chicken increases. What will happen to the market for turkey? Defend your answer with this chart.

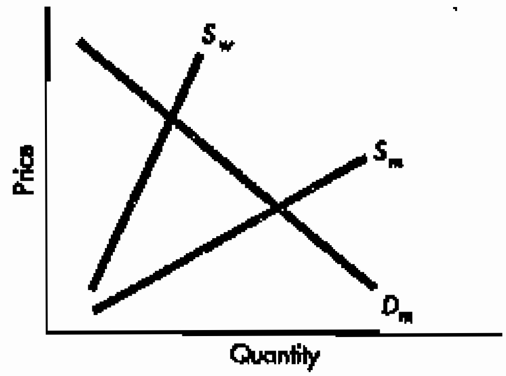
	D	*S*
Price Quantity		

P ________, *Q* ________

VII. Wooden Bats Versus Metal Bats

The supply of wooden bats is shown as S_w on the graph below. It has a steeper slope than the supply of metal bats, S_m, reflecting the fact that it is easier to produce additional metal bats than additional wooden bats.

1. Assume D_m is the demand for metal bats. Suppose baseball purists are willing to pay more for a "sweet crack" sound than for a dull metallic "ping" when they connect with a fastball. Draw a demand curve for wooden bats and label it D_w.



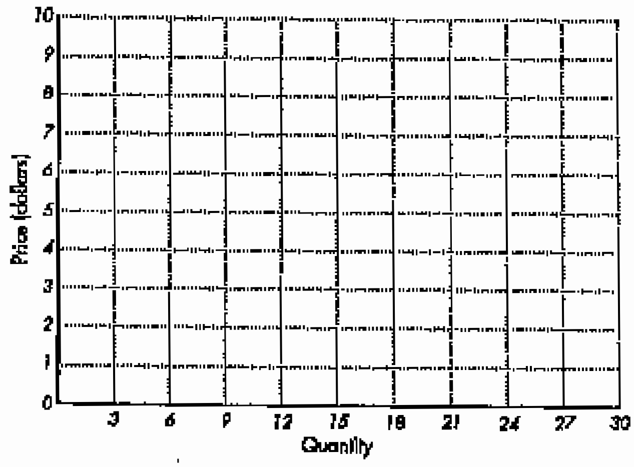
2. What are the consequences for the relative prices of wooden and metal bats?

VIII. For the Algebraically Inclined

1. The Market Demand for Commodity X
   The market for commodity X has three consumers: Gene, Darren, and Todd. The schedules below show each consumer's demand for commodity X.

Gene		Darren		Todd	
P	*Q*	*P*	*Q*	*P*	*Q*
\$6	0	\$6	0	\$6	0
5	2	5	1	5	3
4	4	4	2	4	6
3	6	3	4	3	8
2	8	2	6	2	10
1	10	1	8	1	12

a. Derive and plot the market demand for X on the graph below. Label the curve D_1. The market supply curve is $Q = 3P + 18$. Plot market supply (curve S) on the graph.

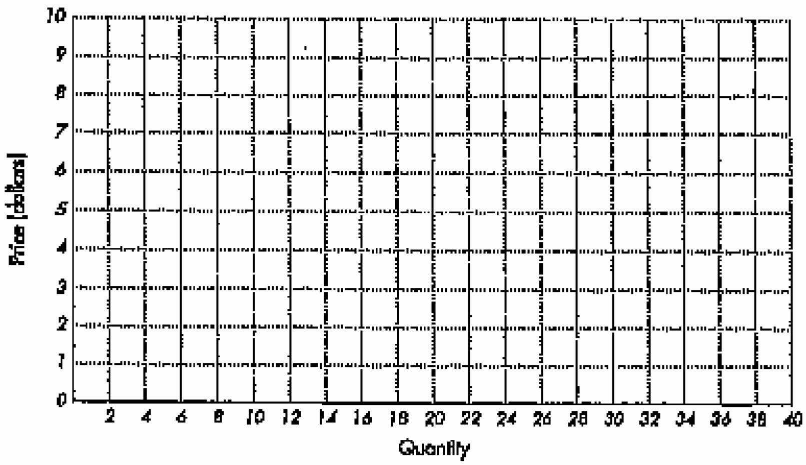


b. The equilibrium price is __________. The equilibrium quantity is __________ units.

2. The Market Demand for Commodity Y
The market for commodity Y has three consumers: Andreas, Katinka, and Sophia. The schedules below show each consumer's demand for commodity Y.

Andreas		Katinka		Sophia	
P	*Q*	*P*	*Q*	*P*	*Q*
$10	0	$10	0	$10	0
9	2	9	2	9	0
8	4	8	3	8	1
7	6	7	4	7	2
6	8	6	5	6	3
5	10	5	6	5	4
4	12	4	7	4	5
3	14	3	8	3	6
2	16	2	9	2	7
1	18	1	10	1	8
0	20	0	11	0	9

a. Derive and plot the market demand curve for Y on the graph below. Label the curve D_1. The market supply curve is $Q = 2P - 2$. Plot market supply (curve S) on the graph.



b. The equilibrium price is ____________. The equilibrium quantity is ____________ units.

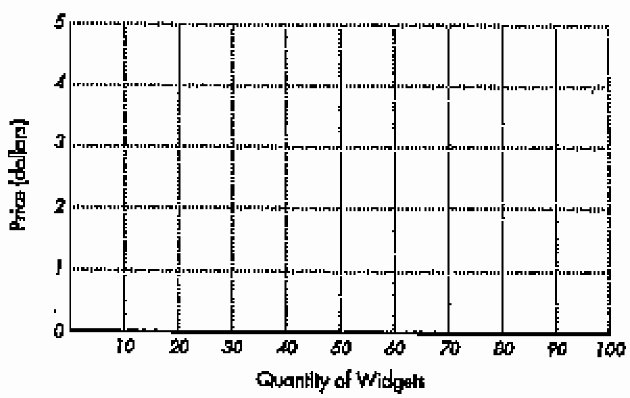
c. Now suppose the price of Z increases, shifting market demand to $Q = 34 - 4P$. Plot and label the new curve D_2.

d. The new equilibrium price is ____________. The new equilibrium quantity is ____________.

e. Z and Y are ____________ (complements, substitutes).

3. Market Equilibrium

a. The equation for demand is $Q = -20P + 110$. Plot demand (curve D) on the graph below. The equation for supply is $Q = 20P - 10$. Plot supply (curve S).



b. The equilibrium price is ____________. The equilibrium quantity is ____________ units.

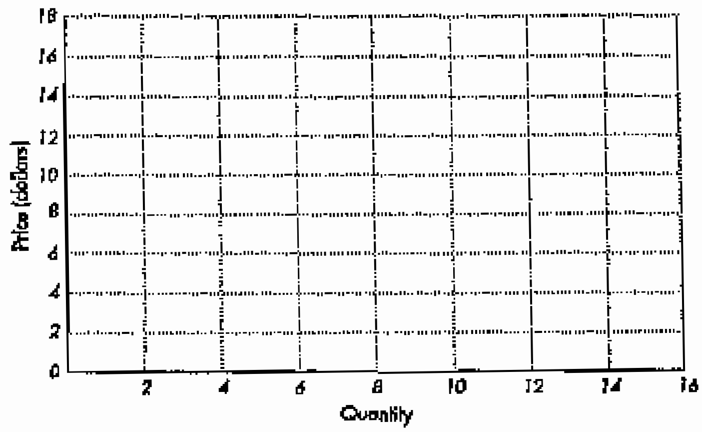
c. A price ceiling of \$2 will cause ____________ (a shortage, a surplus, no change in equilibrium).

d. A price floor of \$4 will cause ____________ (a shortage, a surplus, no change in equilibrium).

e. A price ceiling of \$4 will cause ____________ (a shortage, a surplus, no change in equilibrium).

f. A price floor of \$2 will cause ____________ (a shortage, a surplus, no change in equilibrium).

4. Surpluses and Shortages
   a. The market supply equation is $Q = P - 4$. Plot market supply on the graph below. Label it S. The market demand equation is $Q = 12 - P$. Plot market demand. Label it D_1.



   b. The equilibrium price is __________. The equilibrium quantity is __________ units.
   c. If the price was $10, a __________ (surplus, shortage) of __________ units would develop, driving the price __________ (up, down).
   d. If the price was $6, a __________ (surplus, shortage) of __________ units would develop, driving the price __________ (up, down).
   e. Now suppose consumers' incomes increase, shifting market demand to $Q = 16 - P$. Plot the new demand curve. Label it D_2.
   f. The new equilibrium price is __________, and the new equilibrium quantity is __________ units.

Chapter 3 Homework Problems

Name ______________________________

1. State the law of demand and the law of supply.

2. List the five determinants of demand.

3. Explain the difference between a change in demand and a change in quantity demanded.

4. List the five determinants of supply.

5. Recently, the *Wall Street Journal* ran a story entitled "Man's New Best Friend: The Scaly Iguana." According to the article, iguanas have become very popular pets in some parts of the United States, with sales rising from 28,000 per year in 1986 to over 500,000 per year now. The movie *Jurassic Park* is cited as a reason for the new popularity of iguanas.
   a. Assuming that the supply of iguanas hasn't changed since 1986, sketch a graph showing what happened in the market for iguanas that explains the increase in sales.

   b. Of the five demand determinants, which one best explains the change in the market for iguanas?

   c. As iguanas became more popular, what do you think happened to the price of iguanas?

If your instructor assigns these problems, write your answers above, then tear out this page and hand it in.

Answers

Quick-Check Quiz

Section 1: Markets

1. c; 2. c; 3. a; 4. b; 5. a

If you missed any of these questions, you should go back and review Section 1 in Chapter 3.

Section 2: Demand

1. c (A change in the price of a good causes movement along the curve—a change in quantity demanded—not a change in demand.); 2. b; 3. c; 4. a; 5. e (Items a, b, and c are determinants of demand and cause the demand curve to shift. Item d causes an *increase* in quantity demanded.); 6. b; 7. a; 8. e (Item a causes an increase in quantity demanded. Items b and c cause decreases in demand. Item d affects the *supply* of eggs.); 9. b; 10. e (The demand for coffee tells us the quantity demanded when the price changes, so it does not shift when price changes: you move from one price to another on the same curve. Coffee and tea are substitutes in consumption. When the price of coffee rises, people buy less coffee and substitute tea. They buy more tea at every price, so the demand for tea increases.)

If you missed any of these questions, you should go back and review Section 2 in Chapter 3.

Section 3: Supply

1. b; 2. c; 3. d; 4. a (The supply of military radios tells us the quantity of military radios supplied when the price of radios changes. Supply doesn't change when the price changes: you simply move from one price to another on the same curve. Because microchips and military radios are substitutes in production, when the price of military radios increases, the supply of microchips decreases.); 5. e; 6. e; 7. a; 8. d (A change in the price of a good causes a change in quantity supplied, not a change in supply. Cheese and milk are substitutes in production, so if the price of cheese decreases, the supply of milk increases.); 9. c

If you missed any of these questions, you should go back and review Section 3 in Chapter 3.

Section 4: Equilibrium: Putting Demand and Supply Together

1. a; 2. c; 3. d; 4. a; 5. c; 6. c; 7. d (Item c would be correct if you did not know that the supply change was greater than the demand change.); 8. b; 9. d; 10. d; 11. a; 12. d; 13. c; 14. d; 15. d; 16. b; 17. d; 18. d; 19. a; 20. a; 21. b; 22. b; 23. c; 24. a; 25. e

If you missed any of these questions, you should go back and review Section 4 in Chapter 3.

Practice Questions and Problems

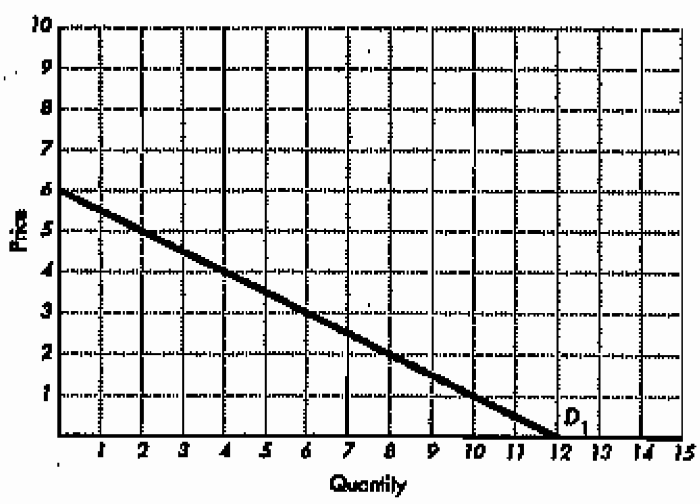
Section 1: Markets

1. market
2. barter
3. double coincidence
4. Relative
5. Barter
6. transaction
7. relative
8. do not

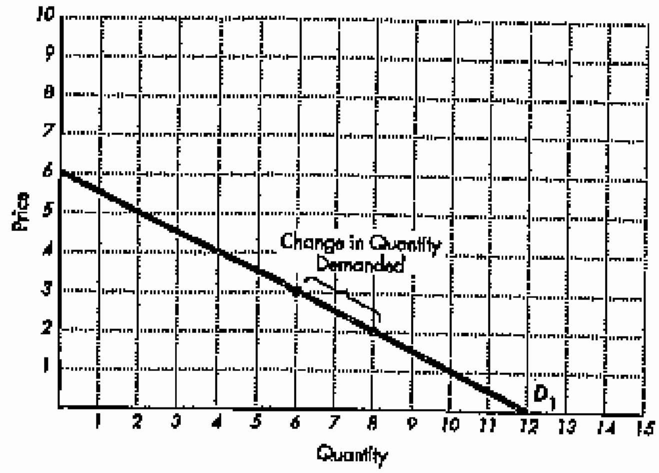
Section 2: Demand

1. Demand
2. lower
3. income
   tastes
   prices of related goods or services
   consumers' expectations
   number of buyers
4. inverse; quantity
5. substitute good
6. income
7. demand curve
8. Substitute
9. complementary
10.

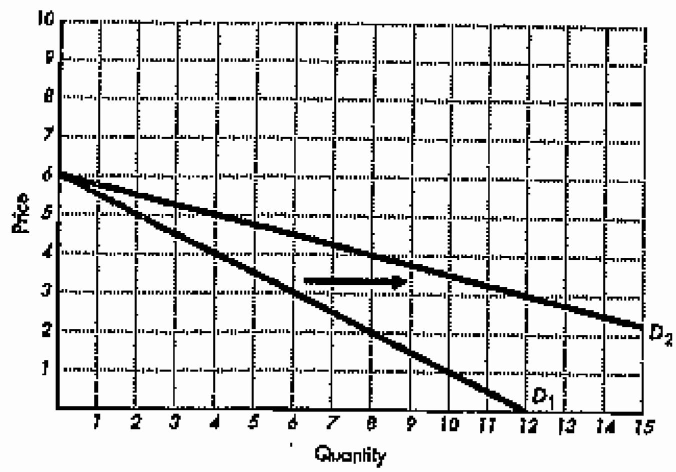
Price per Quart	Market
$0	12
1	10
2	8
3	6
4	4
5	2
6	0



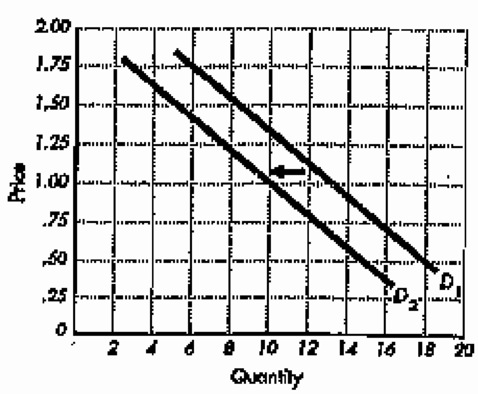
11. quantity demanded



12. increase; demand



13. increases; demand
14. decreased; demand; increased; demand
15. increased; substitutes
16. decreased

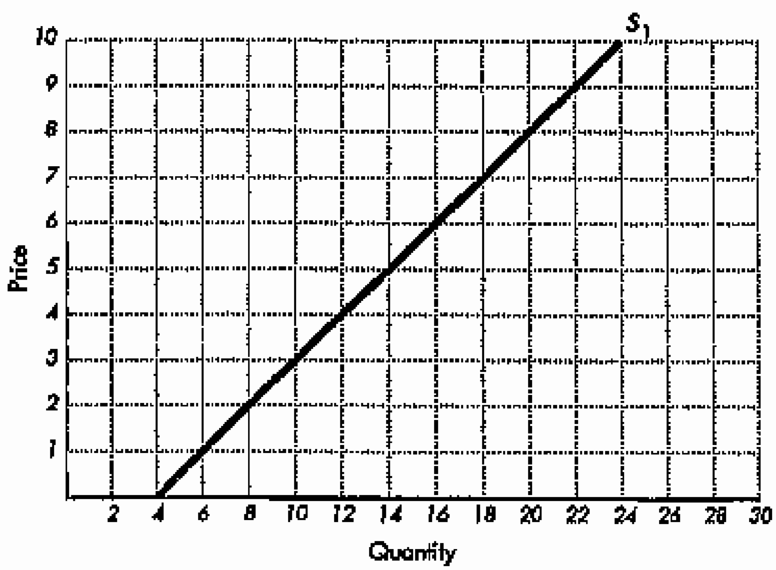


17. increase
18. increase
19. increase

Section 3: Supply

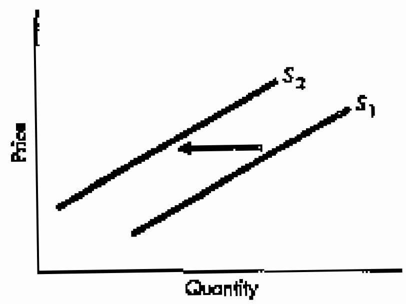
1. Supply
2. decreases
3. supply schedule
4. supply curve
5. positive
6.

Price per Quart	Market
$0	4
1	6
2	8
3	10
4	12
5	14
6	16



7. prices of resources
   technology and productivity
   expectations of producers
   number of producers
   prices of related goods or services

8. supply; decreased



9. supply; decrease
10. Productivity
11. increase; shift to the right
12. notebook paper; decrease
13. increase (The real-estate developer will try to offer as many homes for sale *now*, before incomes drop and the prices of houses drop.)
14. price

Section 4: Equilibrium: Putting Demand and Supply Together

1. equilibrium
2. surplus
3. shortage
4. increases; decreases
5. decreases; increases
6. free
7. same
8. demand for; decrease; decrease; decrease
9. supply of; increase; decrease; increase
10. increase; decrease
11. \$2; 8; \$$3^1/_3$; $10^2/_3$ (The last two values are eyeballed from the graph.); quantity supplied
12. Disequilibrium
13. \$10; 12; 8; 16; surplus; 8; decrease; increase; 18; 6; shortage; 12; increase; decrease
14. Government intervention affects prices (price ceilings or floors).
    Price changes can be slow.
    Buyers and sellers may not want price changes.

Thinking About and Applying Markets, Demand and Supply, and the Price System

I. Changes in Demand

1. No effect on demand. The decrease in supply causes the price to increase, which ultimately will decrease the quantity demanded.
2. No effect on demand. This movement along the demand curve decreases the quantity demanded.
3. No effect on demand. This movement along the demand curve increases the quantity demanded.
4. The demand for coffee decreases (because some people will switch to tea). The quantity demanded decreases.

II. Changes in Supply

1. Left
2. No effect (Consumers' expectations affect demand.)
3. No effect (This is a movement along the supply curve.)
4. Right
5. No effect (This affects demand.)
6. Right
7. Left (A tariff increases producers' costs.)
8. Left (Producers move out of this product and produce the substitute instead.)
9. Left (Taxes increase producers' costs.)
10. No effect (This is a movement along the curve.)

III. Distinguishing Changes in Demand from Changes in Supply

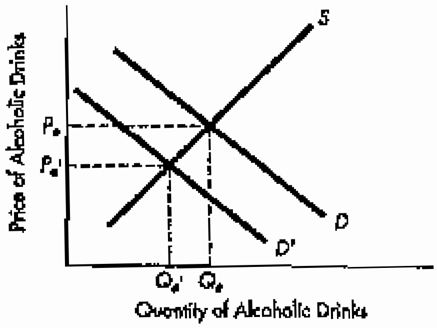
1. S
2. D
3. S
4. S
5. D, S
6. S
7. D
8. D
9. D
10. D
11. S
12. S
13. D

IV. The Market for Battery-Operated Dancing Flowers

	Demand	Supply	Price	Quantity
1.	decrease	no change	decrease	decrease
2.	no change	increase	decrease	increase
3.	no change	increase	decrease	increase
4.	increase	no change	increase	increase
5.	increase	no change	increase	increase
6.	no change	decrease	increase	decrease
7.	no change	decrease	increase	decrease
8.	decrease	no change	decrease	decrease

V. *Drinking and Cancer*

demand; decrease; decrease; decrease



VI. *Simultaneous Shifts in Demand and Supply: A Shortcut Approach*

1.

	D↓	S↑
Price	↓	↓
Quantity	↓	↑

Price will surely decrease, but the effect on quantity is uncertain. If the demand change is larger than the supply change, quantity will decrease. If the supply change is larger than the demand change, quantity will increase.

2.

	D↓	S↓
Price	↓	↑
Quantity	↓	↓

Quantity will surely decrease, but the effect on price is uncertain. If the demand change is larger than the supply change, price will decrease. If the supply change is larger than the demand change, price will increase.

3. An increase in consumers' incomes is one of the five determinants of demand, so this factor will cause demand to increase. Likewise, an increase in the number of buyers will increase demand. Improvements in technology are one of the five determinants of supply. Because these improvements lower costs, supply will increase. We therefore are looking at an increase in demand coupled with an increase in supply. Our chart looks like this:

	D↑	S↑
Price	↑	↓
Quantity	↑	↑

The quantity of home computers will surely increase, but whether the price rises or falls depends on whether the demand shifts outweigh the supply shift. If the shifts in demand overwhelm the shift in supply, prices will increase. If the supply change is larger than the demand change, prices will decrease.

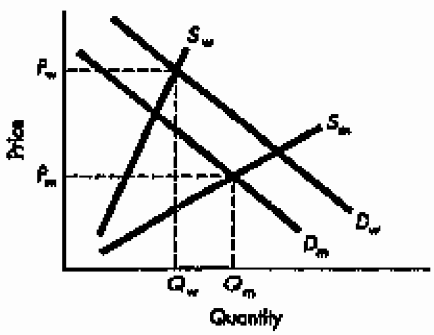
4.

	$D\uparrow$	$S\uparrow$
Price	↑	↑
Quantity	↑	↓

Turkey food is an input for turkey, so if the cost of turkey food increases, the supply of turkey will decrease. Chicken and turkey are substitutes. If the price of chicken increases, consumers will switch to turkey, and the demand for turkey will increase. The price of turkey will surely increase, but whether the quantity increases or decreases depends on which shift (supply or demand) is greater.

VII. Wooden Bats Versus Metal Bats

1.



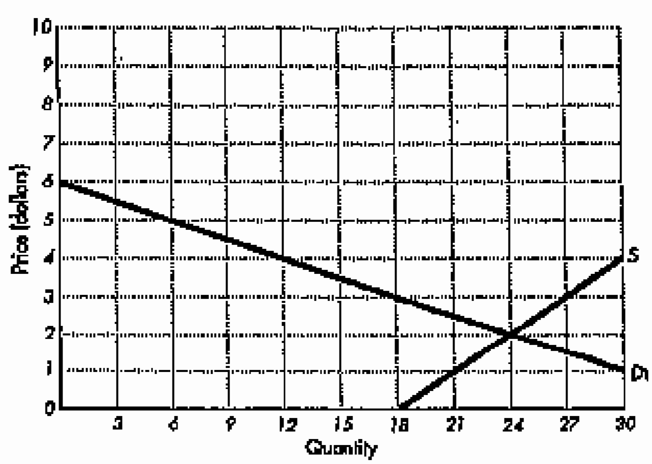
2. If baseball purists prefer wooden bats to metal bats, the demand for wooden bats (D_w) will be to the right of the demand for metal bats (D_m). The price of wooden bats will be higher than the price of metal bats.

VIII. For the Algebraically Inclined

1. The Market Demand for Commodity X

a.

Market Demand	
P	***Q***
\$6	0
5	6
4	12
3	18
2	24
1	30

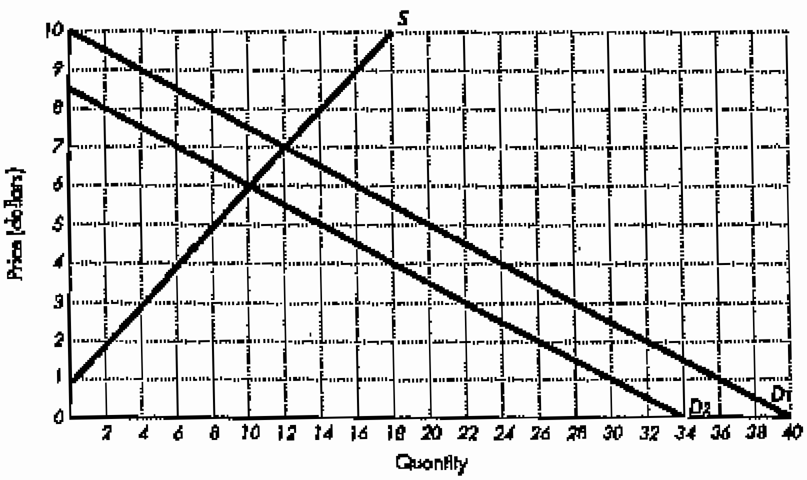


b. $2; 24

2. The Market Demand for Commodity Y

a.

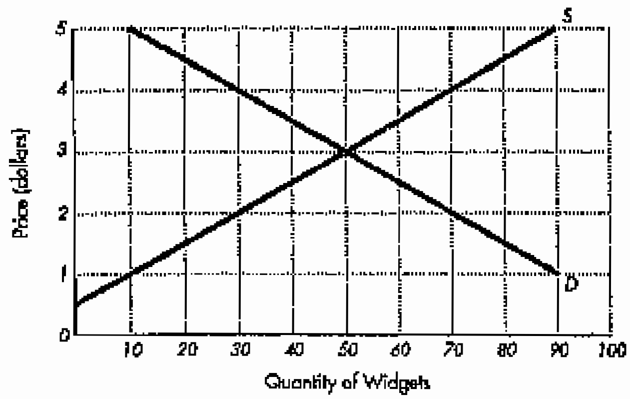
Market Demand	
P	*Q*
$10	0
9	4
8	8
7	12
6	16
5	20
4	24
3	28
2	32
1	36
0	40



b. $7; 12
c. See graph.
d. $6; 10
e. complements (When the price of Z increases, consumers buy less of Z. Because the demand for Y decreased when less of Z was bought, Y and Z are complements.)

3. Market Equilibrium

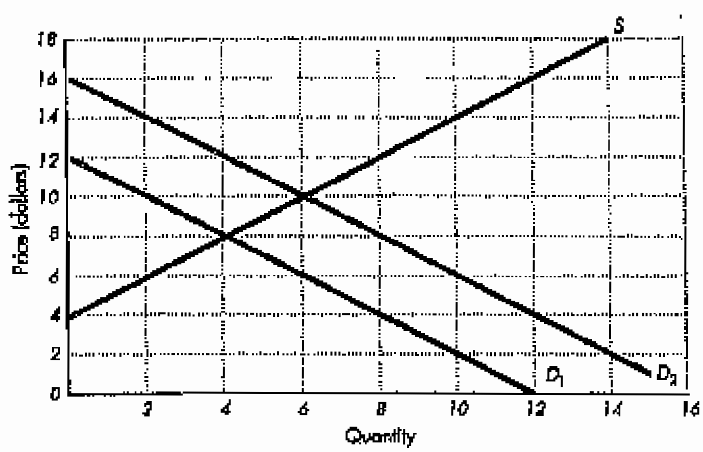
a.



b. $3; 50
c. a shortage (of 40 units)
d. a surplus (of 40 units)
e. no change in equilibrium
f. no change in equilibrium

4. Surpluses and Shortages

a.



b. $8; 4
c. surplus; 4; down
d. shortage; 4; up
e. See a.
f. $10; 6