

Where Prices Come From: The Interaction of Demand and Supply

Chapter Summary

The model of demand and supply explains how prices are determined in a market system. The main factor affecting the demand for a product is its price. A **demand schedule** is a table that lists various prices of a product and the quantities that would be demanded at those prices. A **demand curve** shows this same relationship in a graph. The **law of demand** is the negative relationship between price and **quantity demanded**, holding everything else constant. A change in the price of the product causes a movement along the demand curve and is called a change in the quantity demanded. Other factors that affect demand include prices of related goods (**substitutes** and **complements**), income, tastes, population and **demographics**, and expected future prices. A change in any of these will shift a product's demand curve and is called a change in demand.

The most important factor affecting the supply of a product is its price. A **supply schedule** is a table that lists various prices of a product and the quantities that would be supplied at those prices. A **supply curve** shows this same relationship in a graph. The **law of supply** is the positive relationship between price and **quantity supplied**, holding everything else constant. A change in the price of the product causes a movement along the supply curve and is called a change in the quantity supplied. Other factors that affect supply include prices of inputs, technological change, prices of substitutes in production, expected future prices, and the number of firms in the market. In response to a change in any one of these factors, there will be a change in supply or a shift in the supply curve.

The equilibrium price is the price that will make the quantity demanded be equal to the quantity supplied. This occurs where the supply curve and demand curve intersect. A **surplus** exists when the price charged is above the equilibrium price. A **shortage** exists when the price charged is below the equilibrium price. When the market price is not the equilibrium price, the price will adjust toward the equilibrium price. When the price charged equals the equilibrium price, both consumers and producers are willing to exchange the same quantity of the product and there is no further movement in the market price.

An increase in demand increases equilibrium price and increases the equilibrium quantity. A decrease in demand decreases equilibrium price and decreases the equilibrium quantity. An increase in supply decreases equilibrium price and increases the equilibrium quantity. A decrease in supply increases equilibrium price and decreases the equilibrium quantity.

Learning Objectives

When you finish this chapter, you should be able to:

1. **Discuss the variables that influence demand.** Many factors influence the willingness of consumers to buy a particular product. Among these factors are the income they have to spend and the effectiveness of advertising campaigns of the companies that sell products consumers want. The most important factor in consumer decisions, though, is the price of the product. It is important to note that demand refers not to what a consumer wants to buy but what the consumer is both willing and able to buy. In other words, it's not only what consumers want but also what they can afford.
2. **Discuss the variables that influence supply.** Just as many variables influence consumer demand, many variables influence the willingness and ability of firms to sell a good or service. Among these variables are the prices of inputs used in production and the number of firms in the market. The most important variable that affects firms is the price of whatever they sell.
3. **Use a graph to illustrate market equilibrium.** Economists use graphs to show how demand and supply interact in a competitive market to establish equilibrium. The graph of a competitive market shows that quantity demanded equals quantity supplied at the equilibrium price. When the price is greater than the equilibrium price, a surplus exists. In response to the surplus, the market price will fall to the equilibrium level. When the price is less than the equilibrium price, a shortage exists. In response to the shortage, the market price will rise to the equilibrium level.
4. **Use demand and supply graphs to predict changes in prices and quantities.** Demand and supply in most markets change constantly. As a result, equilibrium prices and quantities change constantly. Graphs show the impact on competitive market equilibrium of increases and decreases in demand and supply.

Chapter Review

Chapter Opener: Apple and the Demand for iPods (pages 66-67)

Apple is a leading seller of digital music players in the United States. Apple's ability to sell iPods is affected by the sales of music from Apple's iTunes website and by the competition's sales of digital music players. Apple currently sells its music on iTunes at a price significantly lower than competitors and at a very low profit margin in order to increase its sales of iPods. Many consumers are choosing to purchase music phones as these provide both a digital music player and a telephone. Apple's success depends on the ability of its executives to analyze and react to changes in the demand and supply of its products.



Helpful Study Hint

Apple and the market for digital music players are used throughout the chapter to demonstrate changes in demand and supply and how they affect prices. ***Making the Connection*** "Apple Forecasts the Demand for iPhones and Other Consumer Electronics" describes Apple's efforts to forecast the demand for the new iPhone in order to determine the price to charge and the expected profit the firm will receive. Apple's projections may or may not be correct, and this could affect the success of the

company. At the end of this chapter, *An Inside Look* describes how Apple and AT&T may benefit from teaming up to supply the iPhone.

Economics in YOUR Life! asks what would happen to your consumption of iPods and Zunes if the prices of these digital music players changed or if the prices of the music downloaded from iTunes and Zune Marketplace changed. Keep this question in mind as you read the chapter. The authors will answer this question at the end of the chapter.

3.1 LEARNING OBJECTIVE

3.1 The Demand Side of the Market (pages 68-75)

Learning Objective 1 Discuss the variables that influence demand.

Although many factors influence the willingness and ability of consumers to buy a particular product, the main influence on consumer decisions is the product's price. The **quantity demanded** of a good or service is the amount that a consumer is willing and able to purchase at a given price. A **demand schedule** is a table showing the relationship between the price of a product and the quantity of the product demanded. A **demand curve** shows this same relationship in a graph. Since quantity demanded always increases in response to a decrease in price, this relationship is called the **law of demand**. The law of demand is explained by the substitution and income effects. The **substitution effect** is the change in the quantity demanded of a good that results from a change in price, making the good more or less expensive relative to other goods that are substitutes. The **income effect** is the change in the quantity demanded of a good that results from the effect of a change in the good's price on consumer purchasing power.

Ceteris paribus ("all else equal") is the requirement that when analyzing the relationship between two variables – such as price and quantity demanded – other variables must be held constant. When one of the non-price factors that influence demand changes, the result is a shift in the demand curve – an increase or decrease in demand. The most important non-price factors that influence demand are prices of related goods (substitutes and complements), income, tastes, population and demographics, and expected future prices.

Substitutes are goods and services that can be used for the same purpose, while **complements** are goods that are used together. A decrease in the price of a substitute for a good, such as iPods, causes the quantity demanded of the substitute, such as Microsoft's Zune music player, to increase (a move along the demand curve for Zunes), which causes the demand for iPods to fall. A fall in demand means that the demand curve for iPods will shift to the left. An increase in the price of Zunes causes the quantity of Zunes demanded to decrease, shifting the demand curve for iPods to the right. Changes in prices of complements have the opposite effect. A decrease in the price of a complement for iPods causes the quantity demanded of the complement, say music downloads from iTunes, to increase, shifting the demand curve for iPods to the right. An increase in the price of downloads on iTunes causes the quantity of downloads demanded to decrease, shifting the demand curve for iPods to the left.

The income that consumers have available to spend affects their willingness to buy a good. A **normal good** is a good for which demand increases as income rises and decreases as income falls. An **inferior good** is a good for which demand increases as income falls and decreases as income rises. When consumers' tastes for a product increase, the demand curve for the product will shift to the right, and when consumers' tastes for a product decrease, the demand curve for the product will shift to the left.

As population increases, the demand for most products increases. **Demographics** are the characteristics of a population with respect to age, race, and gender. As demographics change, the demand for particular

goods will increase or decrease because as different demographic groups become more prevalent in the population their unique preferences will become more prevalent in the market. If enough consumers become convinced that a good will be selling for a lower price in the near future, the demand for the good will decrease in the present. If enough consumers become convinced that the price of a good will be higher in the near future, the demand for the good will increase in the present.



Helpful Study Hint

Students often confuse a change in quantity demanded with a change in demand. Only one variable, the price of a good or service, can cause changes in the quantity demanded of that good or service. This change is described as a movement along a demand curve. Notice that the price of the good or service is on the vertical axis. Changes in demand are caused by changes in nonprice factors. A change in any of these factors causes a shift in the demand curve. Constant repetition is essential to understand this important difference. Use *Making the Connection* “Why Supermarkets Need to Understand Substitutes and Complement” and *Making the Connection* “Companies Respond to a Growing Hispanic Population” to find examples of factors that change demand. Be sure you understand why it is demand and not quantity demanded that changes. Supermarket managers must have a clear understanding of which goods are substitutes and which are complements when deciding what to stock on the shelf. If a product is eliminated because there are other substitutes on the shelf, the demand for a complement to the eliminated product is likely to fall. Companies must also consider the changing demographics of the population and adjust their resources to meeting the needs of the growing demographic groups.

Take time to study Figure 3.3, which shows the difference between a change in demand and a change in quantity demanded. Also take time to study Table 3.1, which lists all the variables that shift market demand curves.

Extra Solved Problem 3-1

Chapter 3 of the textbook includes two Solved Problems. Here is an extra Solved Problem to help you build your skills solving economic problems.

Supports Learning Objective 3-1: Discuss the variables that influence demand.

Suppose that Bob needs to buy an automobile. Bob has decided to purchase a new Miata convertible. Bob’s neighbor tells him that Mazda will be offering a \$3,500 rebate on all its automobiles starting next month.

- Assuming that Bob can wait until next month to buy an automobile, what effect will the rebate have on Bob’s demand for the Miata?
- Which of the variables that influence demand would explain Bob’s change in demand?

SOLVING THE PROBLEM

Step 1: Review the chapter material.

This problem is about variables that shift market demand, so you may want to review the section “Variables That Shift Market Demand,” which begins on page 70 in the textbook.

Step 2: Answer question (a).

Bob’s demand for the Miata will decrease now and increase next month as he will wait to make his purchase in order to take advantage of the rebate.

Step 3: Answer question (b).

Other things being equal, as the expected future price of the Miata falls, the demand for Miatas will fall in the present time period.

3.2 LEARNING OBJECTIVE

3.2 The Supply Side of the Market (pages 75-79)

Learning Objective 2 Discuss the variables that influence supply.

Many variables influence the willingness and ability of firms to sell a good or service. The most important of these variables is the price of the good or service. **Quantity supplied** is the amount of a good or service that a firm is willing to sell at a given price. A **supply schedule** is a table that shows the relationship between the price of a product and the quantity of the product supplied. A **supply curve** shows this same relationship in a graph. The **law of supply** states that, holding everything else constant, increases in the price of the good or service cause increases in the quantity supplied and decreases in the price of the good or service cause decreases in the quantity supplied.

Variables other than the price of the product affect supply. When any of these variables change, a shift in supply – an increase or a decrease in supply – results. The following are the most important variables that shift supply: prices of inputs used in production, technological change, prices of substitutes in production, expected future prices, and the number of firms in the market.

If the price of an input (for example, labor or energy) used to produce a good rises, the supply of the good will decrease and the supply curve will shift to the left. If the price of an input decreases, the supply of the good will increase and the supply curve will shift to the right. **Technological change** is a positive or negative change in the ability of a firm to produce a given level of output with a given amount of inputs. A positive technological change will shift a firm’s supply curve to the right, while a negative technological change will shift a firm’s supply curve to the left.

An increase in the price of an alternative good (B) that a firm could produce instead of producing good A will shift the firm’s supply curve for good A to the left. If a firm expects the price of its product will rise in the future, the firm has an incentive to decrease supply in the present and increase supply in the future. When firms enter a market, the market supply curve shifts to the right. When firms exit a market, the market supply curve shifts to the left.

 **Helpful Study Hint**

The law of supply may seem logical because producers earn more profit when the price they sell their product for rises. But consider Figure 3-4 and the following question: “If Apple can earn a profit from selling 40 million players per month at a price of \$200, why not increase quantity supplied to 45 million and make even more profit?” The upward slope of the supply curve is due not only to the profit motive but the increasing marginal cost of printers. (Increasing marginal costs were discussed in Chapter 2.) Apple will increase its quantity supplied from 40 to 45 million in Figure 3-4 only if the price it will receive is \$250, because the cost of producing 5 million more players is greater than the cost of the last 5 million players.

As with demand and quantity demanded, be careful not to confuse a change in quantity supplied (due only to a change in the price of a product) and a change in supply (a shift of the supply curve in response to one of the non-price factors). Constant reinforcement of this is necessary. Be careful not to refer to an increase in supply as “a downward shift” or a decrease in supply as “an upward shift.” Because demand curves are downward-sloping, an increase in demand appears in a graph as an “upward shift.” But because supply curves are upward-sloping, a *decrease* in supply appears in a graph as an “upward shift.” You should always refer to both changes in demand and supply as being “shifts to the right” for an increase and “shifts to the left” for a decrease to avoid confusion.

Take time to study Figure 3.6, which shows the difference between a change in supply and a change in quantity supplied. Also take time to study Table 3.2, which lists all the variables that shift market supply curves.

Extra Solved Problem 3-2

Supports Learning Objective 3-2: Discuss the variables that influence supply.

To (Soy)bean or not to (Soy)bean ?

Television programming in Illinois features many commercials aimed at farmers. Ads for fertilizer, seed, and farm equipment are as common as commercials for laundry soap and soft drinks. Much of the nation’s corn is grown in Illinois, but the climate and soil conditions in the state are well-suited for growing soybeans as well. Each year, a farmer must decide how many acres of land to plant with corn and how many acres to plant with soybeans.

- a. If both crops can be grown on the same land, why would a farmer choose to produce corn rather than soybeans?
- b. Which of the variables that influence supply would explain a farmer’s choice to produce soybeans or corn?

SOLVING THE PROBLEM

Step 1: Review the chapter material.

This problem is about variables that shift supply, so you may want to refer to the section “Variables That Shift Supply,” which begins on page 77 of the textbook.

Step 2: Answer question (a).

Among the factors that would influence a farmer’s choice is the expected profitability of the two crops. A farmer will grow corn rather than soybeans if he expects the profits from growing corn will be greater than those earned from growing soybeans.

Step 3: Answer question (b).

Other things being equal, as the price of soybeans falls relative to the price of corn, the supply of corn would rise. Because corn and soybeans are substitutes in production, the variable “prices of substitutes in production” is the one that would explain the farmer’s choice.

3.3 LEARNING OBJECTIVE

3.3 Market Equilibrium: Putting Demand and Supply Together (pages 79-82)

Learning Objective 3 Use a graph to illustrate market equilibrium.

The purpose of markets is to bring buyers and sellers together. The interaction of buyers and sellers in markets results in firms producing goods and services consumers both want and can afford. At **market equilibrium**, the price of the product makes quantity demanded equal quantity supplied. A **competitive market equilibrium** is a market equilibrium with many buyers and many sellers. The market price (the actual price you would pay for the product) will not always be the equilibrium price. A **surplus** is a situation in which the quantity supplied is greater than the quantity demanded, which occurs when the market price is above the equilibrium price. Firms have an incentive to increase sales by lowering price. As the market price is lowered, quantity demanded will rise and quantity supplied will fall until the market reaches equilibrium.

A **shortage** is a situation in which quantity demanded is greater than the quantity supplied, which occurs when the market price is below the equilibrium price. Some consumers will want to buy the product at a higher price to make sure they get what they want. As the market price rises, the quantity demanded will fall – not everyone will want to buy at a higher price – and quantity supplied will rise until the market reaches equilibrium. At the competitive market equilibrium, there is no reason for the price to change unless either the demand curve or the supply curve shifts.

 **Helpful Study Hint**

It’s very important to understand how demand and supply interact to reach equilibrium. Remember that adjustments to a shortage or a surplus represent changes in quantity demanded (not demand) and quantity supplied (not supply). *Solved Problem 3-3* and problem 3.4 in the Problems and Applications at the end of the chapter address this topic. In *Solved Problem 3-3*, we see how the demand and supply for the letters written by Lincoln and Booth determine the price for the letters written

by each author. Because the supply is low relative to the demand for Booth's letters, his letters sell for a high equilibrium price. Similarly, because the supply of Lincoln's letters is large relative to the demand, his letters sell for a lower equilibrium price. Market or actual prices are easy to understand because these are the prices consumers are charged. You know the price you paid for a CD because it is printed on the receipt. But no receipt has "equilibrium price" written on it.

To help you understand what an equilibrium price and quantity are, it may help to use an analogy. Suppose you were to push an inflated ball under the surface of a sink filled with water. If you were to release the ball it would move quickly to the surface. If you were to hold the ball above the sink and drop it, the ball would fall to the surface. The surface of the water is the equilibrium position for the ball. A market equilibrium is the position a market will move towards if there is a shortage or surplus.

3.4 LEARNING OBJECTIVE

3.4 The Effect of Demand and Supply Shifts on Equilibrium (pages 83-88)

Learning Objective 4 Use demand and supply graphs to predict changes in prices and quantities.

When the supply curve shifts, the equilibrium price and quantity change in the opposite direction. Increases in supply result from the following non-price factor changes: a decrease in an input price, positive technological change, a decrease in the price of a substitute in production, a lower expected future product price, and an increase in the number of firms in the market. A decrease in supply results in a higher equilibrium price and a lower equilibrium quantity. Decreases in supply result from the following non-price factor changes: an increase in an input price, negative technological change, an increase in the price of a substitute in production, a higher expected future product price, and a decrease in the number of firms in the market.

When the demand curve shifts, the equilibrium price and quantity shift in the same direction. Increases in demand can be caused by any change in a variable that affects demand *except price*. For example, demand will increase if the price of a substitute rises, the price of a complement falls, income rises (for a normal good), income falls (for an inferior good), population increases or the expected future price of the product rises. A decrease in demand results in a lower equilibrium price and lower equilibrium quantity. Decreases in demand can be caused by any change in a variable that affects demand *except the price of the product itself*. For example, demand will decrease if the price of a substitute falls, the price of a complement rises, income falls (for a normal good), incomes rises (for an inferior good), population decreases, or the expected future price of the product falls.



Helpful Study Hint

Use the following features to conduct your own research on how changes in demand and supply affect prices:

- **Making the Connection** "The Falling Prices of LCD TVs"
- **Solved Problem 3-4** on lobsters
- Problem 4.5 on watermelons in the Problems and Applications section

Visit stores that sell these items and find out their market prices. For flat screen televisions, compare the market price you find with the expected prices as described in *Making the Connection* “The Falling Prices of LCD TVs.” *Solved Problem 3-4* shows how the demand and supply for lobsters changes during different times of the year and the effect of those changes on the equilibrium price. In the spring, the demand and supply are both low and the equilibrium price is relatively high. In the summer, the demand for lobsters increases, but the supply of lobsters increases relatively more. This causes the summer price for lobsters to be lower than the equilibrium price in the spring. For lobsters and watermelon, ask sellers how current prices compare with prices at different times of the year. Draw demand and supply graphs that represent the market conditions you observe. You can ask your instructor if your analysis is correct.

In *Don't Let This Happen to YOU!* “Remember: A Change in a Good's Price Does *Not* Cause the Demand or Supply Curve to Shift,” the textbook reiterates the idea that a change in the price of a good causes a movement along the curve under analysis. For example, an increase in supply will cause the equilibrium price of the good to rise. This increase in the price of the good will cause a movement up along the demand curve, or a decrease in the quantity demanded. This is not a change in demand and not a shift in the curve.

The section *Economics in YOUR Life!* in this chapter asks what would happen to your consumption of iPods and Zunes if the prices of these digital music players changed or if the prices of the music downloaded from iTunes and Zune Marketplace changed. Because the Zune and the iPod are substitutes, if the price of one of the players increased, the demand for the other music player would increase. For example, if the price of the Zune increases, the demand curve for the iPod would shift to the right. Similarly, the price of complements, such as music downloaded from iTunes or Zune Marketplace, affects the demand for the digital music players. For example, if the price of music downloads on iTunes falls, the demand for iPods would increase and the demand for Zunes would decrease.

Key Terms

Ceteris paribus (“all else equal”). The requirement that when analyzing the relationship between two variables – such as price and quantity demanded – other variables must be held constant.

Competitive market equilibrium. A market equilibrium with many buyers and sellers.

Complements. Goods and services that are used together.

Demand curve. A curve that shows the relationship between the price of a product and the quantity of the product demanded.

Demand schedule. A table showing the relationship between the price of a product and the quantity of the product demanded.

Demographics. The characteristics of a population with respect to age, race, and gender.

Income effect. The change in the quantity demanded of a good that results from the effect of a change in the good's price on consumers' purchasing power.

Inferior good. A good for which the demand increases as income falls and decreases as income rises.

Law of demand. The rule that, holding everything else constant, when the price of a product falls, the quantity demanded of the product will increase, and when the price of a product rises, the quantity demanded of the product will decrease.

Law of supply. The rule that, holding everything else constant, increases in price cause increases in the quantity supplied, and decreases in price cause decreases in the quantity supplied.

Market demand. The demand by all the consumers of a given good or service.

Market equilibrium. A situation in which quantity demanded equals quantity supplied.

Normal good. A good for which the demand increases as income rises and demand decreases as income falls.

Perfectly competitive market. A market that meets the conditions of (1) many buyers and sellers, (2) all firms selling identical products, and (3) no barriers to new firms entering the market.

Quantity demanded. The amount of a good or service that a consumer is willing and able to purchase at a given price.

Quantity supplied. The amount of a good or service that a firm is willing and able to supply at a given price.

Shortage. A situation in which the quantity demanded is greater than the quantity supplied.

Substitutes. Goods and services that can be used for the same purpose.

Substitution effect. The change in the quantity demanded of a good that results from a change in price, making the good more or less expensive relative to goods that are substitutes.

Supply curve. A curve that shows the relationship between the price of a product and the quantity of the product supplied.

Supply schedule. A table that shows the relationship between the price of a product and the quantity of the product supplied.

Surplus. A situation in which the quantity supplied is greater than the quantity demanded.

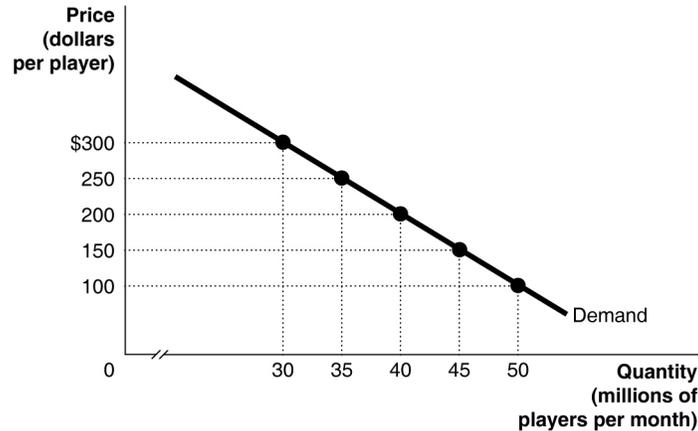
Technological change. A positive or negative change in the ability of a firm to produce a given level of output with a given amount of inputs.

Self-Test

(Answers are provided at the end of the Self-Test.)

Multiple-Choice Questions

1. Refer to the graph below. The point of \$250 and 35 million players represents a point on the market demand curve for digital music players. Which of the following interpretations of this point on the graph is correct?

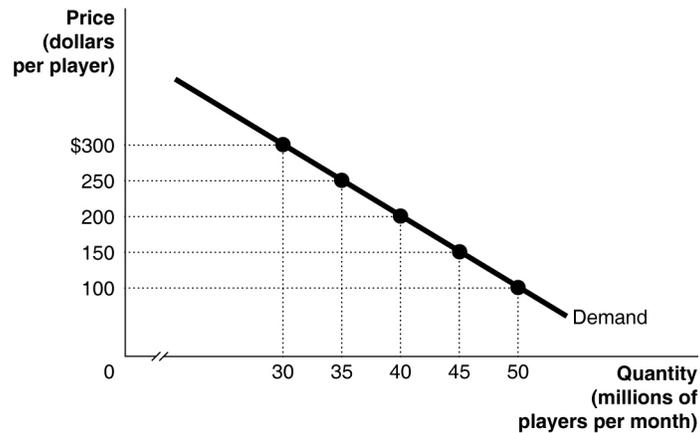


- The dot shows that consumers spend a total of \$250 on 35 million players each month.
 - When one player costs \$250, consumers buy 35 million of them per month.
 - When one player costs \$250, suppliers sell 35 million of them per month.
 - At \$250, quantity demanded equals quantity supplied.
2. What does the term *quantity demanded* refer to?
- The total amount of a good that a consumer is willing to buy per month.
 - The quantity of a good or service demanded that corresponds to the quantity supplied.
 - The quantity of a good or service that a consumer is willing and able to purchase at a given price.
 - None of the above.
3. Which of the following is the correct definition of *demand schedule*?
- The quantity of a good or service that a consumer is willing to purchase at a given price.
 - A table showing the relationship between the price of a product and the quantity of the product demanded.
 - A curve that shows the relationship between the price of a product and the quantity of the product demanded.
 - The demand for a product by all the consumers in a given geographical area.

4. Which of the following is the correct definition of *demand curve*?
 - a. The quantity of a good or service that a consumer is willing to purchase at a given price.
 - b. A table showing the relationship between the price of a product and the quantity of the product demanded.
 - c. A curve that shows the relationship between the price of a product and the quantity of the product demanded.
 - d. The demand for a product by all the consumers in a given geographical area.

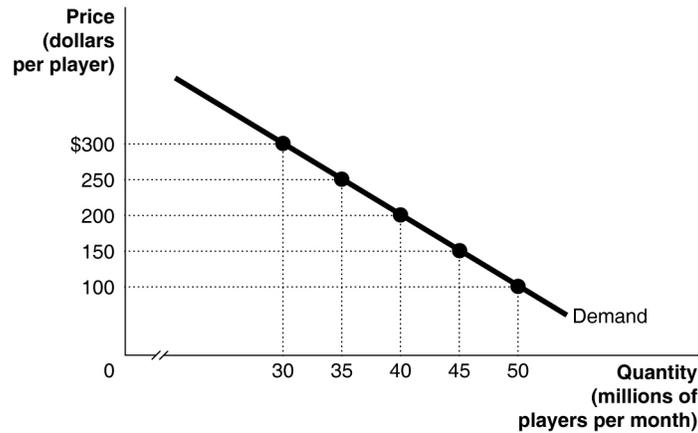
5. Which of the following is the correct definition of *market demand*?
 - a. The quantity of a good or service that a consumer is willing to purchase at a given price.
 - b. A table showing the relationship between the price of a product and the quantity of the product demanded.
 - c. A curve that shows the relationship between the price of a product and the quantity of the product demanded.
 - d. The demand by all the consumers for a given good or service.

6. Refer to the graph below. What happens to quantity demanded along this demand curve?



- a. It increases as the price increases.
- b. It increases as the price decreases.
- c. It may increase or decrease as the price increases.
- d. It is not related to price.

7. Refer to the graph below. Along the demand curve, what happens to the quantity demanded as the price falls from \$250 to \$200 per player?



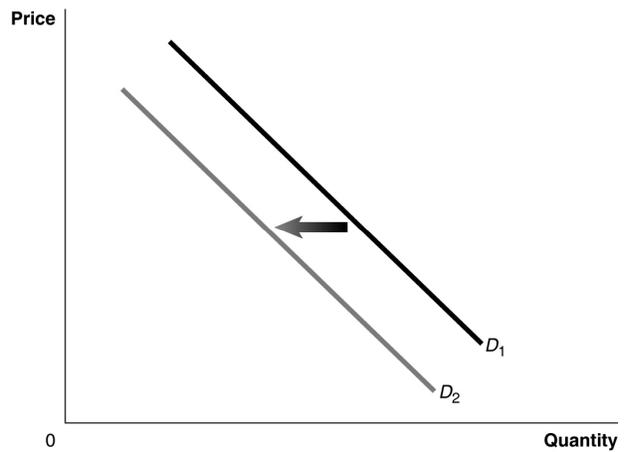
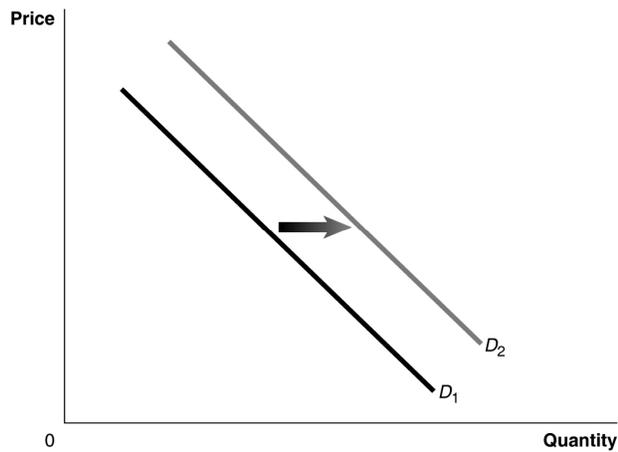
- The quantity demanded rises from 35 million to 40 million players per month.
 - The quantity demanded falls from 40 million to 35 million players per month.
 - We cannot predict the change in the quantity demanded without the supply curve.
 - The change in the quantity demanded is not related to a change in price.
8. When the price of a digital music players rises, the quantity of digital music players demanded by consumers falls. According to this statement, what do we call the demand curve for digital music players?
- Unpredictable
 - Upward sloping
 - Downward sloping
 - An exception to the law of demand
9. Which of the following explains why there is an inverse relationship between the price of a product and the quantity of the product demanded?
- The substitution effect
 - The income effect
 - The law of demand
 - The price effect
10. What is the *law of demand*?
- The law of demand states that a change in the quantity demanded, caused by changes in price, makes the good more or less expensive relative to other goods.
 - The law of demand states that a change in the quantity demanded, caused by changes in price, affects a consumer's purchasing power.
 - The law of demand states that, holding everything else constant, when the price of good falls, the quantity demanded will increase, and vice versa.
 - The law of demand is the requirement that when analyzing the relationship between price and quantity demanded, other variables must be held constant.

11. Which of the following best describes how changes in price affect a consumer's purchasing power?
 - a. The law of demand
 - b. The substitution effect
 - c. The income effect
 - d. The term *ceteris paribus*

12. Which of the following best describes how consumers consider buying other goods when the price of a good rises?
 - a. The law of demand
 - b. The substitution effect
 - c. The income effect
 - d. The term *ceteris paribus*

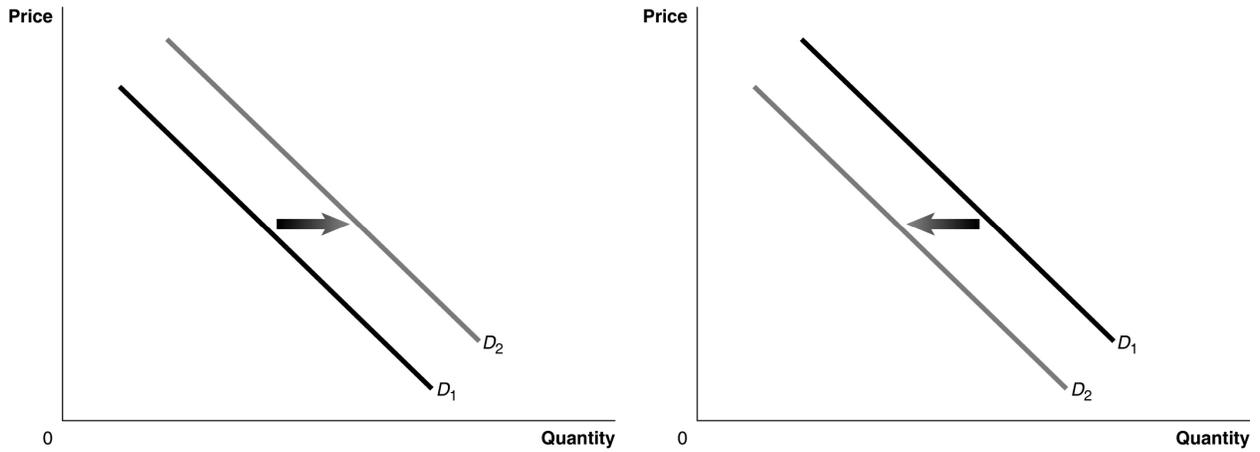
13. When analyzing the relationship between the price of a good and quantity demanded, other variables must be held constant. Which term best describes such an assumption?
 - a. The law of demand
 - b. The substitution effect
 - c. The income effect
 - d. *Ceteris paribus*

14. Refer to the graphs below. Each graph refers to the demand for digital music players. Which of the graphs best describes the impact of an increase in the price of a substitute good?
 - a. The graph on the left
 - b. The graph on the right
 - c. Both graphs
 - d. Neither graph



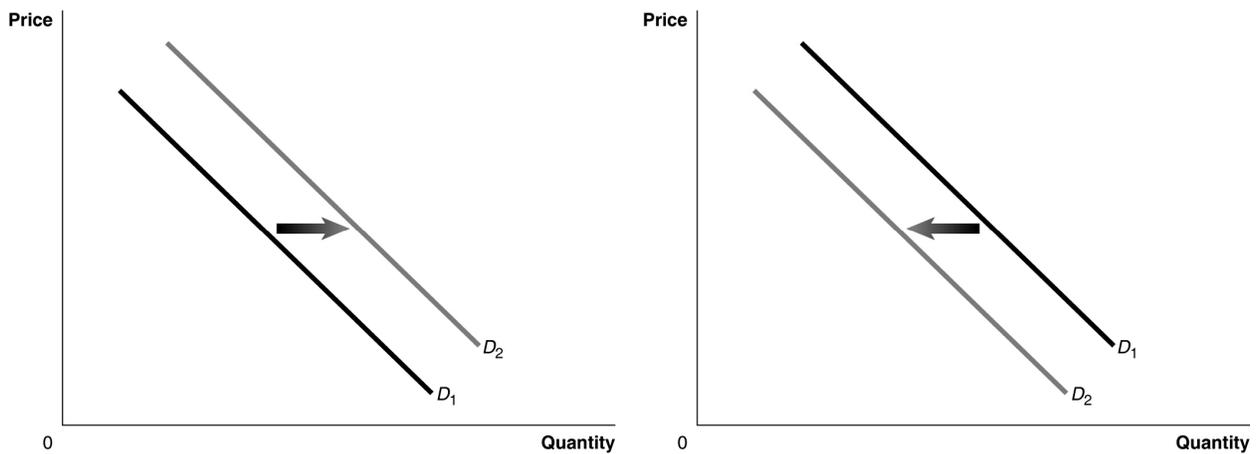
- a. The graph on the left
- b. The graph on the right
- c. Both graphs
- d. Neither graph

15. Refer to the graphs below. Each graph refers to the demand for digital music players. Which of the graphs best describes the impact of an increase in the price of a complementary good?



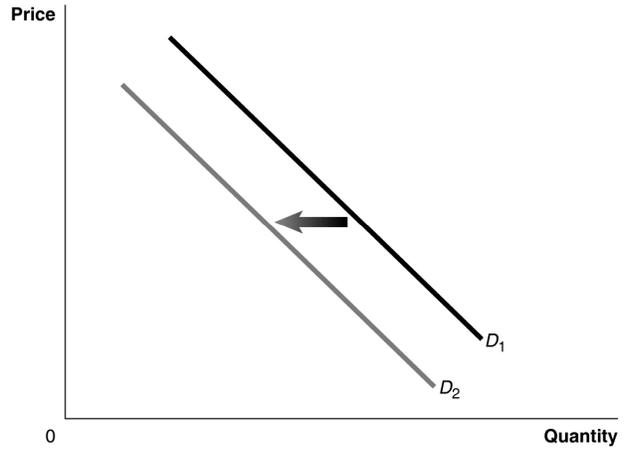
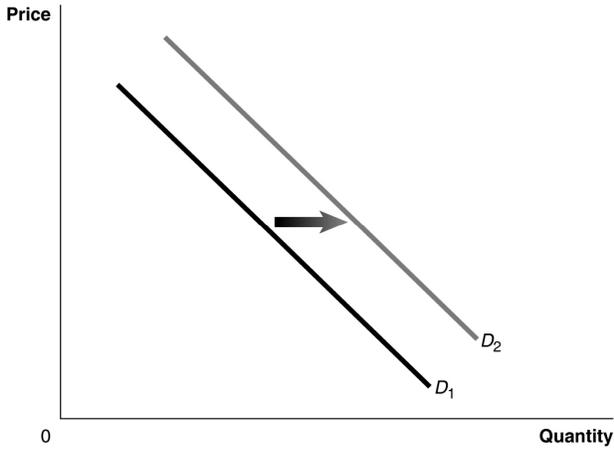
- a. The graph on the left
- b. The graph on the right
- c. Both graphs
- d. Neither graph

16. Refer to the graphs below. Each graph refers to the demand for digital music players. Which of the graphs best describes the impact of an increase in income, assuming that printers are a normal good?



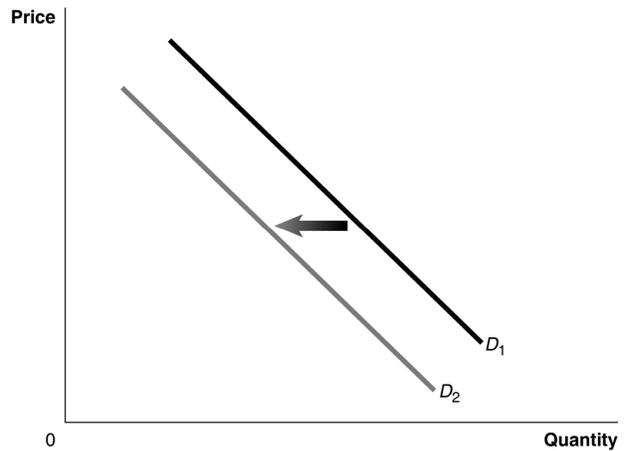
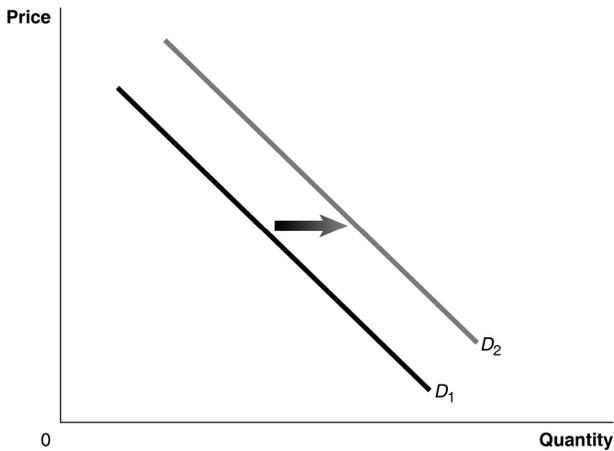
- a. The graph on the left
- b. The graph on the right
- c. Both graphs
- d. Neither graph

17. Refer to the graphs below. Each graph refers to the demand for digital music players. Which of the graphs best describes the impact of an increase in the *taste* for digital music players?



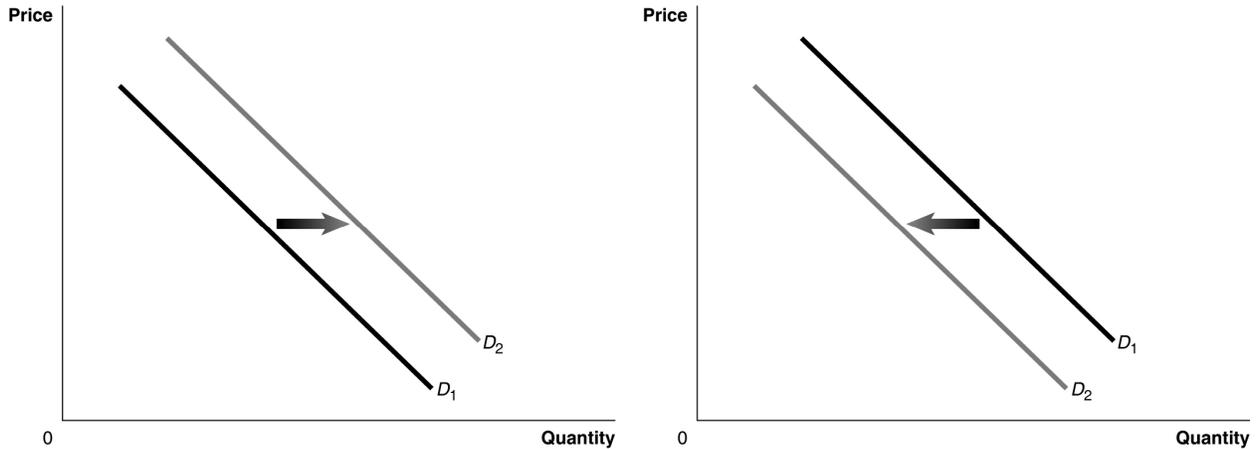
- a. The graph on the left
- b. The graph on the right
- c. Both graphs
- d. Neither graph

18. Refer to the graphs below. Each graph refers to the demand for digital music players. Which of the graphs best describes the impact of an increase in population?



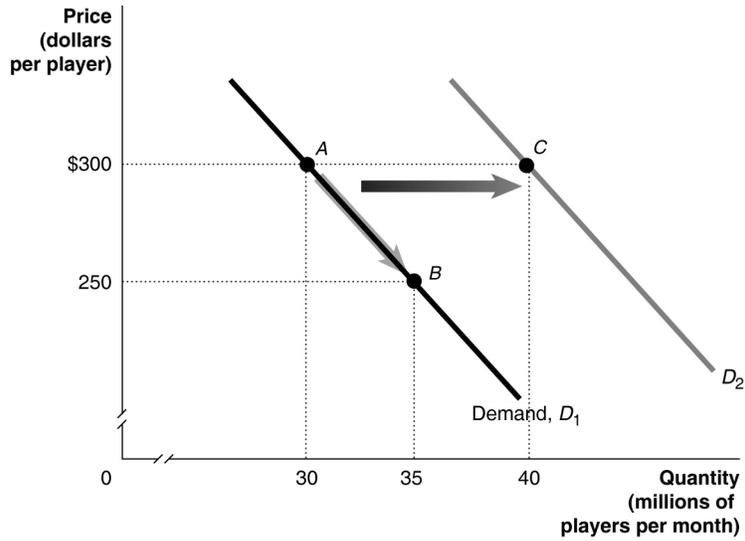
- a. The graph on the left
- b. The graph on the right
- c. Both graphs
- d. Neither graph

19. Refer to the graphs below. Each graph refers to the demand for digital music players. Which of the graphs best describes the impact of an increase in the expected price of digital music players in the future?



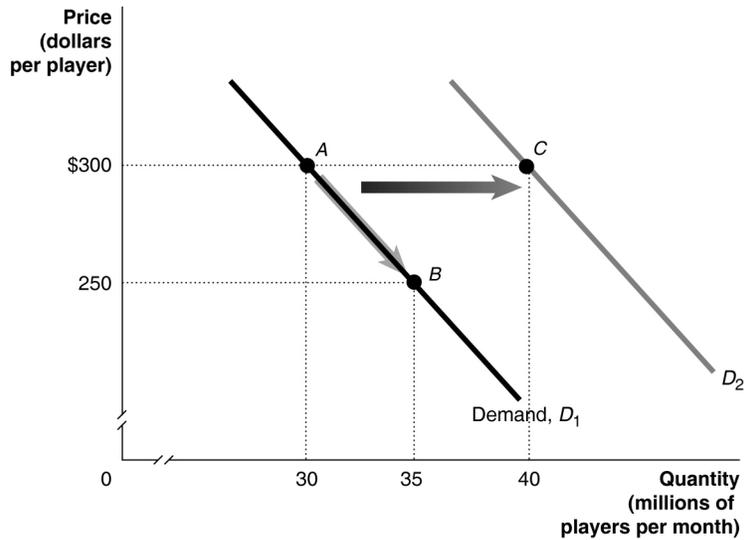
- a. The graph on the left
 - b. The graph on the right
 - c. Both graphs
 - d. Neither graph
20. When two goods are *complements*, which of the following occurs?
- a. The two goods can be used for the same purpose.
 - b. The two goods are used together.
 - c. The demand for each of these goods increases when income rises.
 - d. The demand for each of these goods increases as income falls.
21. When two goods are *substitutes*, which of the following occurs?
- a. The two goods can be used for the same purpose.
 - b. The two goods are used together.
 - c. The demand for each of these goods increases when income rises.
 - d. The demand for each of these goods increases as income falls.
22. What is an *inferior good*?
- a. A good for which demand increases as income rises.
 - b. A good for which demand decreases as income rises.
 - c. A good that cannot be used together with another good.
 - d. A good that does not serve any real purpose.
23. What is a *normal good*?
- a. A good for which demand increases as income rises.
 - b. A good for which demand decreases as income rises.
 - c. A good that can be used together with another good.
 - d. A good that does serves more than one purpose.

24. Refer to the graph below. Which of the following moves best describes a *change in demand*?



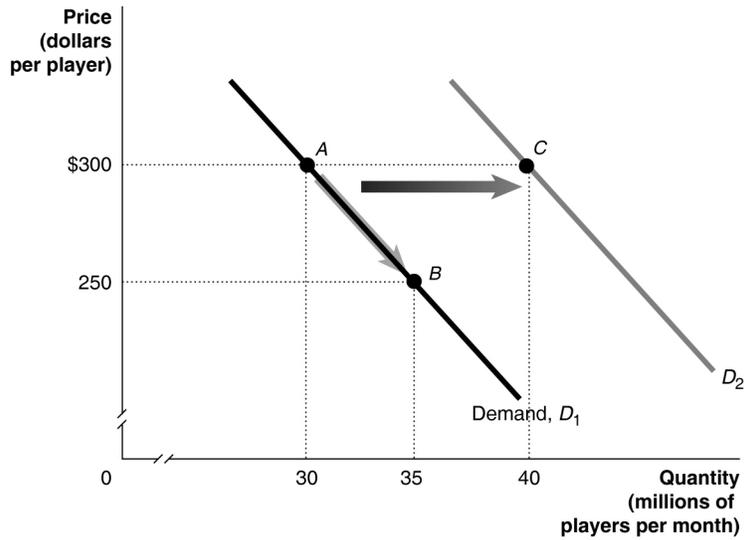
- a. The move from A to B
- b. The move from A to C
- c. Either the move from A to B or from A to C
- d. The move from B to A

25. Refer to the graph below. Which of the following moves best describes a *change in quantity demanded*?



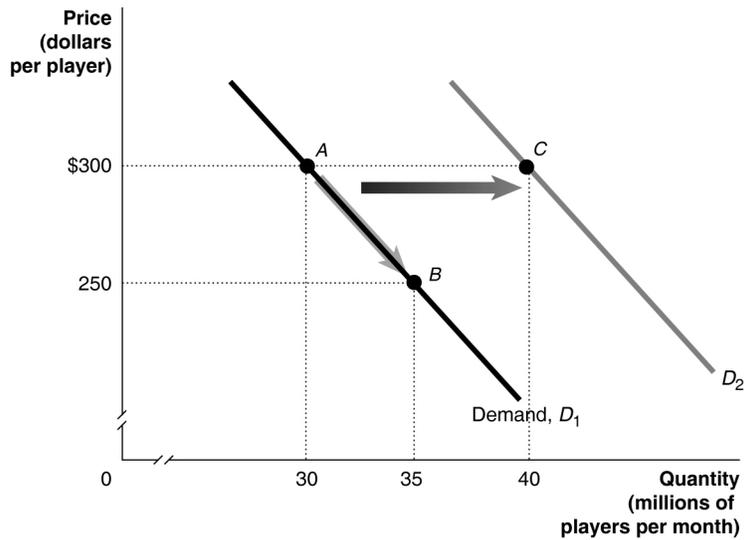
- a. The move from A to B
- b. The move from A to C
- c. Either the move from A to B or from A to C
- d. The move from B to C

26. Refer to the graph below. Which of the following moves best describes what happens when there is a change in a determinant of the demand for digital music players other than the price of players?



- a. A move from A to B
- b. A move from A to C
- c. Either the move from A to B or from A to C
- d. None of the above

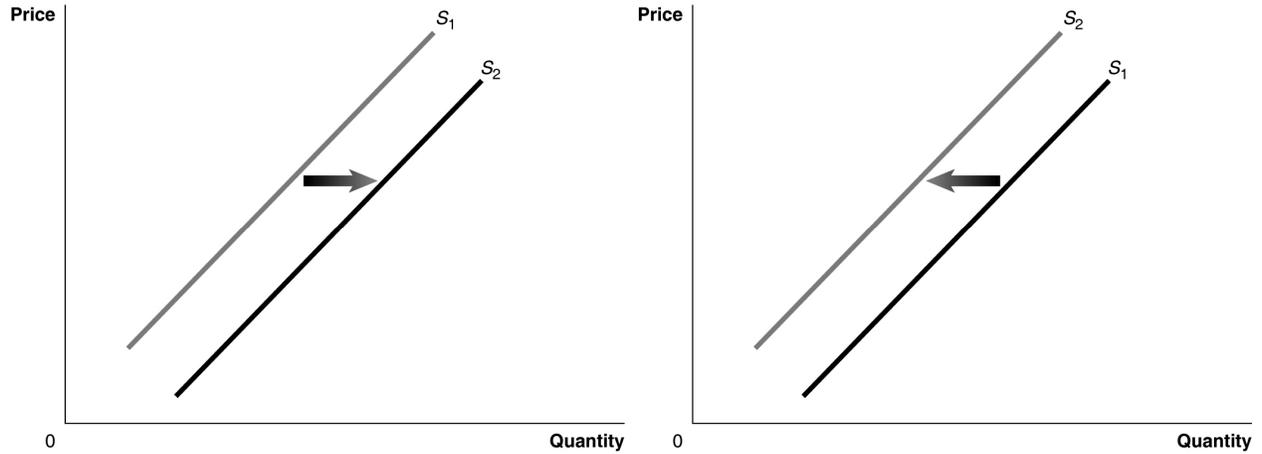
27. Refer to the graph below. Which of the following moves best describes what happens when a change in the price of digital music players affects the market demand for players?



- a. A move from A to B
- b. A move from A to C
- c. Either the move from A to B or from A to C
- d. None of the above

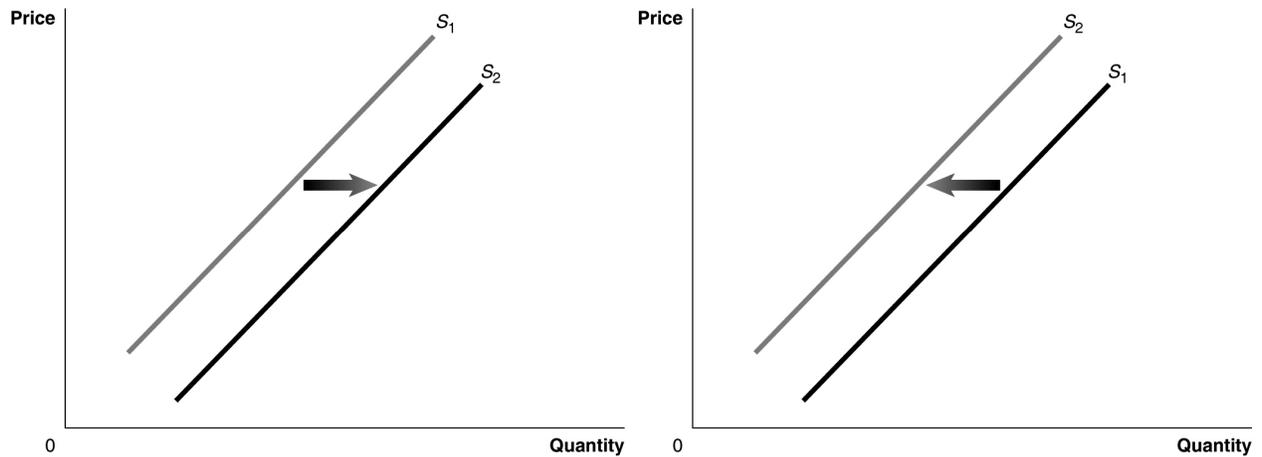
28. Which of the following would NOT shift the demand curve for a good or service?
- A change in the price of a related good
 - A change in the price of the good or service
 - A change in expectations about the price of the good or service
 - A change in income
29. What does the term *quantity supplied* refer to?
- The quantity of a good or service that a firm is willing and able to supply at a given price.
 - A table that shows the relationship between the price of a product and the quantity of the product supplied.
 - A curve that shows the relationship between the price of a product and the quantity of the product demanded.
 - None of the above
30. Which of the following is the textbook's definition of *supply schedule*?
- The quantity of a good or service that a firm is willing to supply at a given price.
 - A table that shows the relationship between the price of a product and the quantity of the product supplied.
 - A curve that shows the relationship between the price of a product and the quantity of the product demanded.
 - None of the above
31. Which of the following is the textbook's definition of *supply curve*?
- The quantity of a good or service that a firm is willing to supply at a given price.
 - A table that shows the relationship between the price of a product and the quantity of the product supplied.
 - A curve that shows the relationship between the price of a product and the quantity of the product supplied.
 - None of the above
32. Which of the following is consistent with the law of supply?
- An increase in price causes an increase in the quantity supplied, and a decrease in price causes decrease in the quantity supplied.
 - A change in price causes a shift of the supply curve.
 - Supply shifts are caused not by a single variable but most likely by a number of different variables.
 - All of the above

33. Refer to the graphs below. Each graph refers to the supply for digital music players. Which of the graphs best describes the impact of an increase in the price of an input?



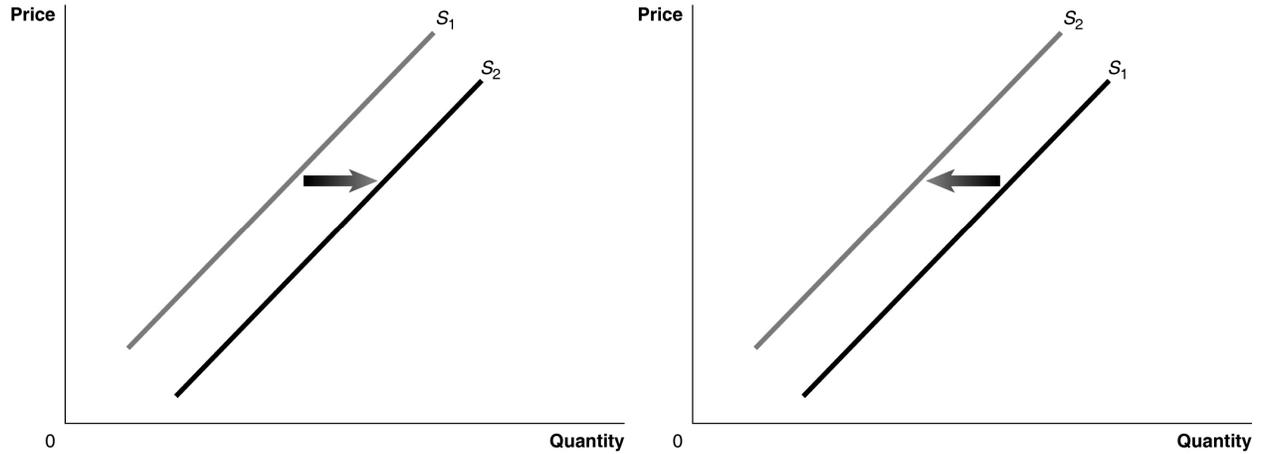
- a. The graph on the left
- b. The graph on the right
- c. Both graphs
- d. Neither graph

34. Refer to the graphs below. Each graph refers to the supply for digital music players. Which of the graphs best describes the impact of an increase in productivity?



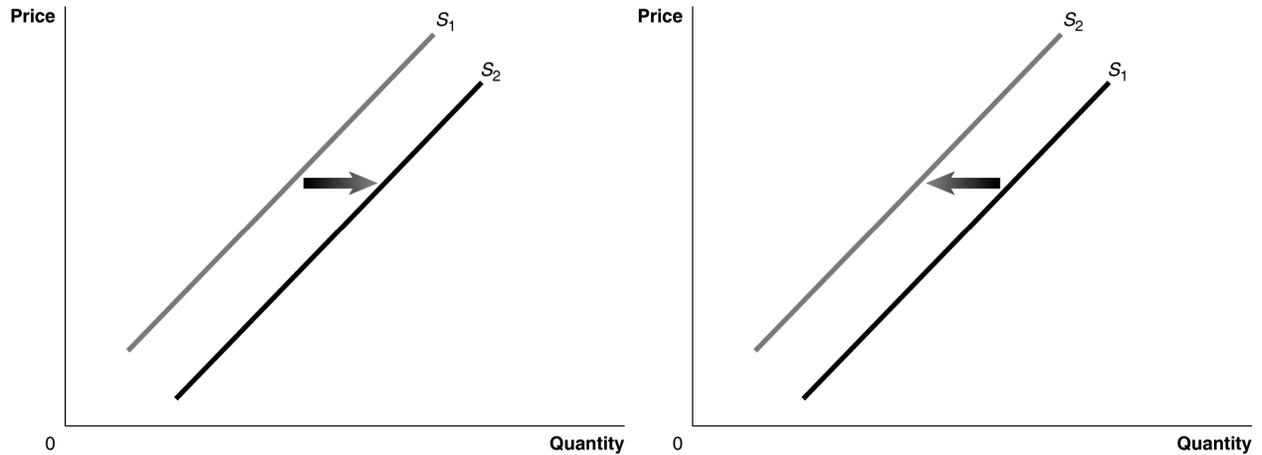
- a. The graph on the left
- b. The graph on the right
- c. Both graphs
- d. Neither graph

35. Refer to the graphs below. Each graph refers to the supply for digital music players. Which of the graphs best describes the impact of an increase in the price of a substitute in production?



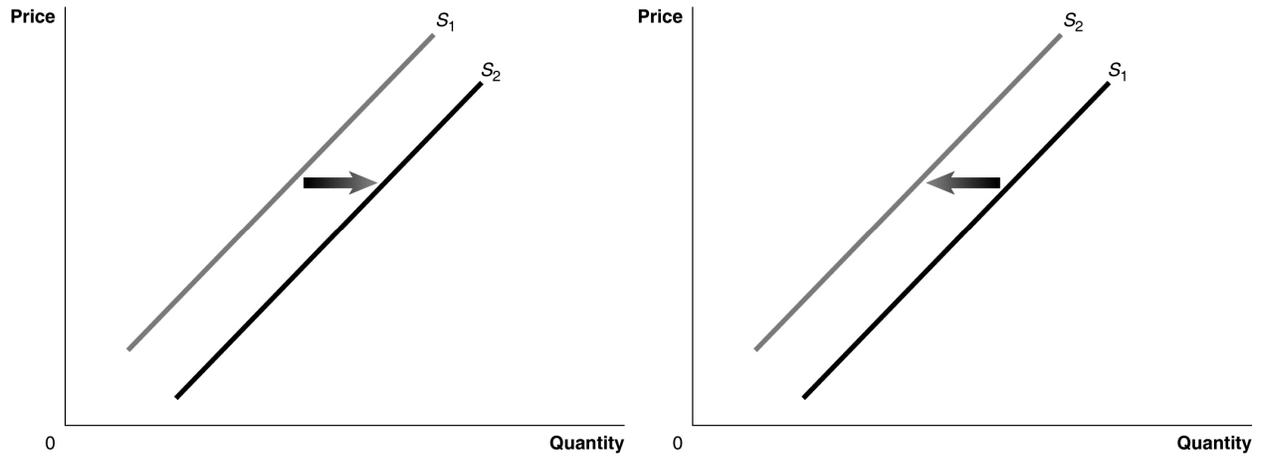
- a. The graph on the left
- b. The graph on the right
- c. Both graphs
- d. Neither graph

36. Refer to the graphs below. Each graph refers to the supply for digital music players. Which of the graphs best describes the impact of an increase in the expected future price of the product?



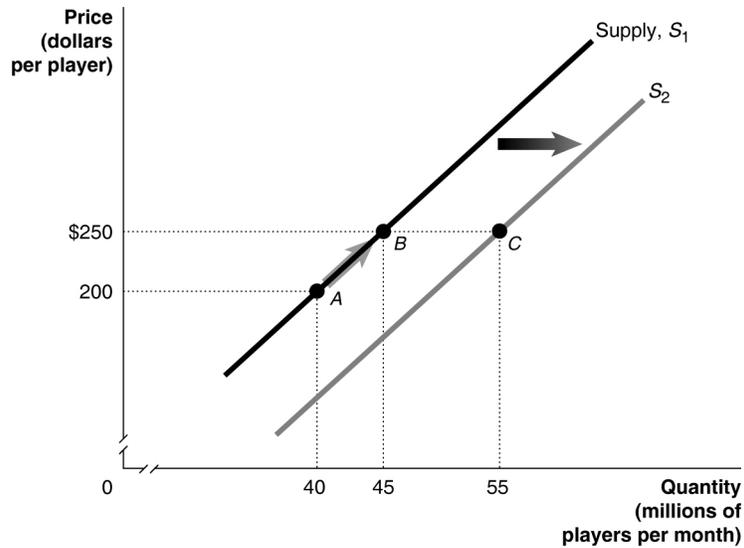
- a. The graph on the left
- b. The graph on the right
- c. Both graphs
- d. Neither graph

37. Refer to the graphs below. Each graph refers to the supply for digital music players. Which of the graphs best describes the impact of an increase in the number of firms in the market?



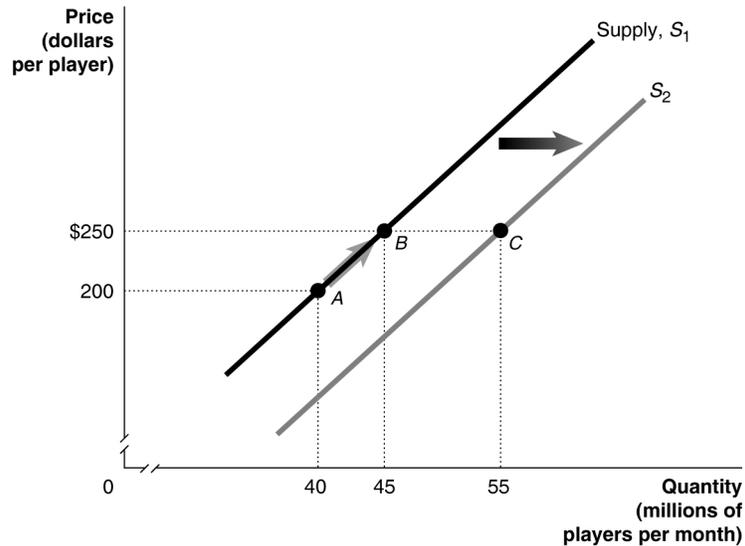
- a. The graph on the left
- b. The graph on the right
- c. Both graphs
- d. Neither graph

38. Refer to the graph below. Which of the following moves best describes what happens when there is a change in a determinant of the supply for digital music players other than the price of players?



- a. A move from A to B
- b. A move from A to C
- c. Either the move from A to B or from A to C
- d. None of the above

39. Refer to the graph below. Which of the following moves best describes what happens when a change in the price of digital music players affects the market supply for players?



- A move from A to B
 - A move from A to C
 - Either the move from A to B or from A to C
 - None of the above
40. A surplus exists in a market if the actual price is
- equal to equilibrium price.
 - below equilibrium price.
 - above equilibrium price.
 - either above or below the equilibrium price.
41. If a shortage exists in a market we know that the actual price is
- below equilibrium price and quantity demanded is greater than quantity supplied.
 - above equilibrium price and quantity demanded is greater than quantity supplied.
 - above equilibrium price and quantity supplied is greater than quantity demanded.
 - below equilibrium price and quantity supplied is greater than quantity demanded.
42. An early frost in the apple orchards of Washington State would cause
- an increase in the demand for apple juice, increasing price.
 - an increase in the supply of apple juice, decreasing price.
 - a decrease in the demand for apple juice, decreasing price.
 - a decrease in the supply of apple juice, increasing price.
43. Which of the following would definitely result in a higher price in the market for tennis shoes?
- demand increases and supply decreases
 - demand and supply both decrease
 - demand decreases and supply increases
 - demand and supply both increase

44. Suppose that the income of buyers in a market increases and a technological advancement also occurs. What would we expect to happen in the market for a normal good?
- The equilibrium price would increase, but the impact on the amount sold in the market would be ambiguous.
 - The equilibrium price would decrease, but the impact on the amount sold in the market would be ambiguous.
 - Equilibrium quantity would increase, but the impact on equilibrium price would be ambiguous.
 - Both equilibrium price and equilibrium quantity would increase.

Short Answer Questions

1. What evidence can be used to support the following statement? “Tickets to the World Series and the Super Bowl do not sell at their equilibrium prices.”

2. In response to a surplus, a firm will lower a product’s price until the quantity supplied equals quantity demanded. But prices of some goods will fall more quickly than others. What type of good would a firm lower the price of quickly in response to a surplus?

3. Explain the difference between a shortage and scarcity.

4. During 2007 there were over 80,000 people on waiting lists for kidney, lung, and other organ transplant operations. By law, organ donors and their families in the United States may not be paid for the donated organs. If payments for organ donations were made legal in the United States, would this affect the demand or the quantity demanded for organ transplants demanded?

5. The demand for health care in the United States is expected to rise throughout the first part of the twenty-first century. Which of the variables that influence market demand is most responsible for this expected increase?

True/False Questions

- T F 1. A market demand curve demonstrates the quantity that each consumer is willing to buy at each possible price.
- T F 2. The law of demand states that, holding everything else constant, increases in price cause decreases in demand.
- T F 3. The price of lobsters is higher in the spring than in the summer, even though demand is greater in summer. The lower summer price results from increases in the supply of lobsters in the summer.
- T F 4. As a result of a surplus, the price in a market will fall; quantity supplied falls and quantity demanded rises until the new equilibrium is reached.
- T F 5. An increase in income causes demand for a normal good to increase.
- T F 6. It is better for a supermarket to remove a slow-selling good from its shelves if it is a substitute for another good than if it is a complement with another good.
- T F 7. Inferior goods are goods that are of lesser quality than other similar goods.
- T F 8. Substitution and income effects are used to explain the law of supply.
- T F 9. A negative technological change will shift the supply curve for a product to the left.
- T F 10. Increases in the supply of flat-screen televisions led to lower prices and increased quantity demanded for these televisions.
- T F 11. An increase in the price of a complement for good A will decrease the demand for good A.
- T F 12. When Microsoft decided to start producing the Zune music player, the market supply curve for players shifted to the left.

- T F 13. An increase in the demand for digital music players will cause an increase in the price of digital music players and an increase in the supply of digital music players.
- T F 14. A change in price will not cause a change in demand or supply.
- T F 15. Competitive markets have many buyers and many sellers.

Answers to the Self-Test

Multiple-Choice Questions

Question	Answer	Comment
1	b	In this example, the quantity of players demanded per month is 35 million when the price per player is \$250.
2	c	Quantity demanded is the quantity purchased per period of time for a given price.
3	b	The demand schedule is a table, not a curve or a single amount of quantity demanded at a given price.
4	c	This is the definition of <i>demand curve</i> .
5	d	This is the definition of <i>market demand</i> .
6	b	The demand curve is downward sloping. There is an inverse relationship between price and quantity demanded. Price and quantity demanded move in opposite directions.
7	a	The demand curve is downward sloping, so as the price falls the quantity demanded rises.
8	c	The consumers' demand curve is downward sloping. There is an inverse relationship between price and quantity demanded. Price and quantity demanded move in opposite directions.
9	c	The law of demand states that there is an inverse relationship between the price of a product and the quantity of the product demanded.
10	c	According to the law of demand, there is an inverse relationship between the price of a product and the quantity of the product demanded.
11	c	Along with the substitution effect, the income effect helps to explain why a demand curve is downward sloping. (Note that the income effect only works in this direction for normal goods.)
12	b	The substitution effect, along with the income effect, helps to explain why a demand curve is downward sloping. (Note that the income effect only works in this direction for normal goods.)
13	d	The term <i>ceteris paribus</i> means controlling variables during an analysis.
14	a	This graph shows an increase in demand. When the price of a substitute good rises, the demand for the good in question also rises.
15	b	Demand decreases when the price of a complementary good increases.
16	a	This graph shows an increase in demand. When income rises, the demand for any normal good also rises.
17	a	This graph shows an increase in demand. When tastes for a product rise, the demand for the good in question also rises.
18	a	This graph shows an increase in demand. When population rises, the demand for the good in question also rises.
19	a	This graph shows an increase in demand. When the expected future price of a product rises, the demand for the good in question today also rises.
20	b	Complementary goods work together.
21	a	The two goods can be used in place of each other.
22	b	The term inferior good means consumers will buy less of a good as income rises.

- 23 a The term normal good means consumers will buy more of a good as income rises.
- 24 b By definition, anything that causes a demand curve to shift also causes a change in demand.
- 25 a By definition, anything that causes movement along a single demand curve also causes a change in quantity demanded. And the only factor that can change quantity demanded is a change in the price of the product.
- 26 b When any variable that affects demand changes, demand shifts. (The sole exception to this rule is changes in the price of the product.)
- 27 a By definition anything that causes movement along a single demand curve also causes a change in quantity demanded. And the only factor that can change quantity demanded is a change in the price of the product.
- 28 b A change in the price of a good or service does not cause a shift in the demand curve. It would cause a movement along the demand curve.
- 29 a *Quantity supplied* is the quantity of a good or service that a firm is willing to supply at a given price. When any variable that affects demand changes, demand shifts. (The sole exception to this rule is changes in the price of the product.)
- 30 b A table that shows the relationship between the price of a product and the quantity of the product supplied is called the *supply schedule*. By definition anything that causes movement along a single demand curve also causes a change in quantity demanded. And the only factor that can change quantity demanded is a change in the price of the product.
- 31 c A curve that shows the relationship between the price of a product and the quantity of the product supplied is called a supply curve. *Quantity supplied* is the quantity of a good or service that a firm is willing to supply at a given price.
- 32 a This is the law of supply. A table that shows the relationship between the price of a product and the quantity of the product supplied is called the *supply schedule*.
- 33 a This graph shows a decrease in supply. When the price of an input increases, supply decreases.
- 34 b This graph shows an increase in supply. When productivity increases, supply increases.
- 35 a This graph shows a decrease in supply. When the price of a substitute in production increases, supply for the good in question decreases because more of the substitute is produced and less of the good in question is produced.
- 36 a This graph shows a decrease in supply. When the expected future price of a product increases, supply for the good in question decreases today because less of the good will be produced today and more will be produced in the future in order to take advantage of the higher price in the future.
- 37 b This graph shows an increase in supply. When the number of firms in the market increases, market supply increases.
- 38 b A determinant of supply other than price will cause a shift in the supply curve. In this case, the supply increases or the supply curve shifts to the right.
- 39 a If the price of a good changes that will cause a movement along the supply curve. This movement from *A* to *B* is an increase the quantity supplied.
- 40 c If the actual price is above the equilibrium price, the quantity supplied is greater than the quantity demanded, so there is a surplus.
- 41 a If the actual price is below the equilibrium price, the quantity demanded is greater than the quantity supplied, so there is a shortage.
- 42 d If there is a frost, it will destroy the apples, which will cause the price of apples to rise. Since apples are an input in the production of apple juice, the supply of apple juice will decrease.
- 43 a The price will rise when the demand increases and the supply decreases, though the effect on the equilibrium quantity will be ambiguous.

- 44 c Both the demand and supply shift right, which will cause an increase in the equilibrium quantity and an ambiguous effect on the price.

Short Answer Responses

1. Tickets for these events typically sell out soon after they are offered to the public. Many of these tickets are later resold at prices higher than the original prices buyers paid for them. This implies that the quantity demanded for the tickets is greater than the quantity supplied at the original prices. The prices the tickets are first sold at are below their equilibrium levels. (Event promoters often price tickets this way to create additional publicity about the event.)
2. Prices of perishable goods such as fresh fish, baked goods, milk, and fruit are likely to be lowered quickly. A key factor is the product's durability. Services are the most perishable products, but a head of lettuce is not much more durable. On the other hand, cars and home appliances can be stored as inventories for quite some time without spoiling.
3. A shortage exists when the price for a product is less than the equilibrium price. If the price is allowed to rise to its equilibrium level, the shortage will be eliminated. But the product will be scarce whether the market price is above, below, or equal to its equilibrium value. Every economic product is scarce because unlimited human wants exceed society's limited productive resources.
4. Because the price of organs and transplant operations would rise, this would affect quantity demanded rather than demand. An increase in the price of organs and transplant operations would typically decrease the quantity demanded. But it is unlikely that the quantity demanded would change very much, if at all, because there are no good substitutes for the operations. And it's unusual for the transplant recipient to pay for the operation since surgery is usually covered by health insurance. This makes demand even less responsive to changes in price.
5. Demographics are most responsible for this change. As more members of the so-called "baby boomer" generation reach retirement age, their demand for health care will increase. (Most health care spending is for care of those over age 60.)

True/False Answers

1. F The demand curve shows the quantity that all consumers would collectively demand at each possible price.
2. F Increases in price cause decreases in quantity demanded, not demand.
3. T Even though demand increases in the summer, the supply increases even more.
4. T A surplus would cause firms to want to decrease their supply to reduce their inventories. As the price falls the quantity demanded increases and the quantity supplied decreases.
5. T A normal good is one for which as income rises the demand increases.
6. T If the good is a substitute, consumers will buy the related good instead. If it is a complement and you remove it from the shelf they will no longer buy the complement.
7. F Inferior goods are ones that you buy less of as your income rises.
8. F Substitution and income effects explain the law of demand.
9. T If something causes technology to decrease, the supply will decrease.
10. T As the supply increases, the market price will fall, which will cause a movement down the demand curve, i.e. there will be an increase in the quantity demanded.

11. T Complements are consumed together, such as coffee and creamer. If the price of one increases, consumers will buy less of the related good.
12. F An increase in the number of suppliers for digital music players will cause an increase in supply.
13. F An increase in demand for digital music players will cause an increase in the supply of digital music players, but it will not increase the supply. It will increase the quantity supplied.
14. T A change in price causes a change in the quantity demanded or quantity supplied, not demand or supply.
15. T A competitive market must have many buyers and many sellers.