- Scarcity exists because we have limited resources and unlimited wants. No society has ever had enough resources to produce all the goods and services its members wanted.
- Because of scarcity, all decisions involve costs.
- Opportunity cost is the forgone benefit of the next best alternative when resources are used for one purpose rather than another.
- A production possibilities curve graphically illustrates scarcity, choices and opportunity costs.
- The slope of a production possibilities curve shows the opportunity cost of producing one more unit of one good in terms of the amount of the other good that must be given up.
- The law of comparative advantage shows how everyone can gain through trade by specializing in producing the good or service with the lowest opportunity cost.
- In a market system, resources are allocated in response to relative prices.
- A demand curve shows all the prices and quantities at which consumers are willing and able to purchase a good or service. The law of demand states that consumers will want to buy more at a lower price and less at a higher price.
- There is a difference between a change in demand and a change in quantity demanded. A change in quantity demanded is a movement along the demand curve and can be caused only by a change in the price of the good or service. At a lower price, a larger quantity is demanded. A change in demand is a shift in the curve whereby more or less is demanded at every price. Changes in preferences, incomes, expectations, population, or the prices of complementary or substitute goods will cause a change in demand.
- A supply curve shows all the prices and quantities at which producers are willing and able to sell a good or service. Producers want to sell more at a higher price and less at a lower price.
- There is a difference between a change in supply and a change in quantity supplied. A change in quantity supplied is a movement along the supply curve and can be caused only by a change in the price of the good or service. At a lower price, a smaller quantity is supplied. A change in supply is a shift of the curve whereby more or less is supplied at every price. A change in technology, in production costs or in the number of sellers (firms) will cause a change in supply.
- In competitive markets, supply and demand schedules are the sum of many individual decisions to sell and to buy. The interaction of supply and demand determines the price and quantity that will clear the market. The price where the quantity supplied and quantity demanded are equal is called the equilibrium or market-clearing price.
- Equilibrium prices and quantities are determined as follows: At a price higher than equilibrium, there is a surplus and pressure on sellers to lower their prices. At a price lower than equilibrium, there is a shortage and pressure on buyers to offer higher prices.
- In a market economy, prices provide information, allocate resources and act as rationing devices. It is important to know how to illustrate a wide range of situations with supply and demand graphs.

- Price elasticity of demand refers to how much the quantity demanded changes in relation to a given change in price. If the percentage change in quantity demanded is greater than the percentage change in price, the demand for the good is considered elastic. If the percentage change in quantity demanded is less than the percentage change in price, the demand for the good is considered inelastic. If the percentage change in price is equal to the percentage change in quantity demanded, the demand for the good is considered unit elastic.

Scarcity, Opportunity Cost and Production Possibilities Curves

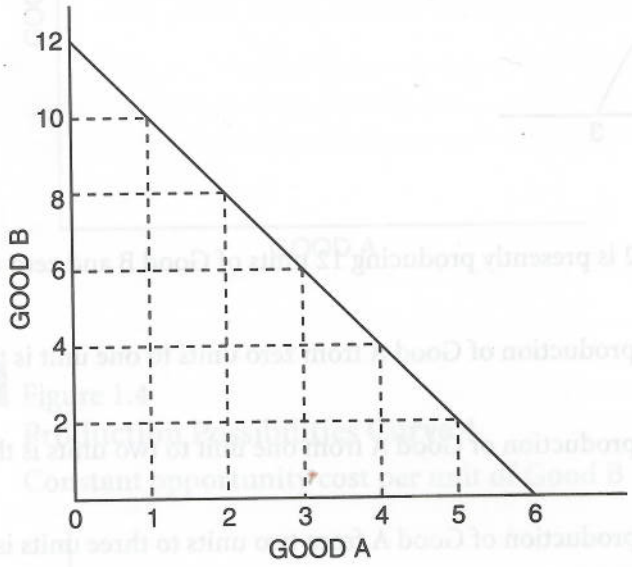
Scarcity necessitates choice. Consuming or producing more of one commodity or service means consuming or producing less of something else. The opportunity cost of using scarce resources for one commodity or service instead of something else is often represented in graphical form as a *production possibilities curve.*

Part A

Use Figures 1.1 and 1.2 to answer Questions 1 and 2. Fill in the answer blanks, or underline the correct answer in parentheses.

Figure 1.1

Production Possibilities Curve 1



1. If the economy represented by Figure 1.1 is presently producing 12 units of Good B and zero units of Good A:

   (A) The opportunity cost of increasing production of Good A from zero units to one unit is the loss of _____ unit(s) of Good B.

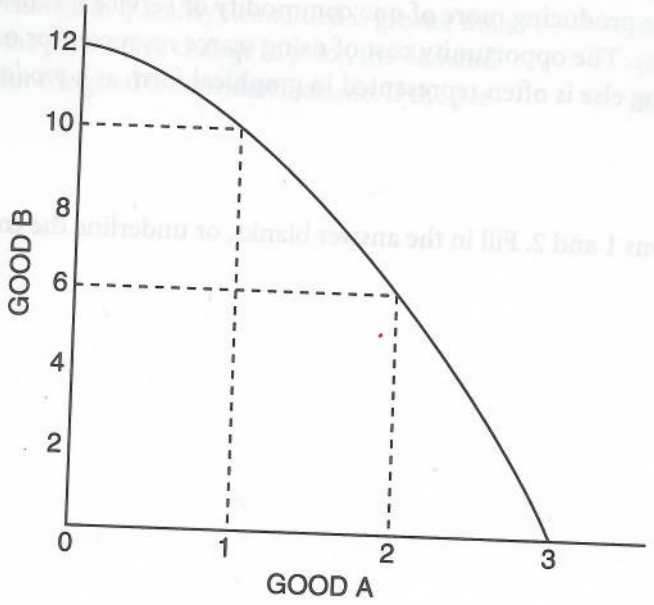
   (B) The opportunity cost of increasing production of Good A from one unit to two units is the loss of _____ unit(s) of Good B.

   (C) The opportunity cost of increasing production of Good A from two units to three units is the loss of _____ unit(s) of Good B.

   (D) This is an example of *(constant / increasing / decreasing / zero)* opportunity cost per unit for Good A.

Adapted from Phillip Saunders, *Introduction to Microeconomics: Student Workbook,* 18th ed. (Bloomington, Ind., 1998). Copyright ©1998 Phillip Saunders. All rights reserved.

Figure 1.2
Production Possibilities Curve 2



2. If the economy represented in Figure 1.2 is presently producing 12 units of Good B and zer of Good A:

   (A) The opportunity cost of increasing production of Good A from zero units to one unit is loss of _____ unit(s) of Good B.

   (B) The opportunity cost of increasing production of Good A from one unit to two units is loss of _____ unit(s) of Good B.

   (C) The opportunity cost of increasing production of Good A from two units to three units loss of _____ unit(s) of Good B.

   (D) This is an example of (*constant / increasing / decreasing / zero*) opportunity cost per unit Good A.

Part B

Use the axes in Figures 1.3 and 1.4 to draw the type of curve that illustrates the label above each axis.

Figure 1.3

Production Possibilities Curve 3

Increasing opportunity cost per unit of Good B

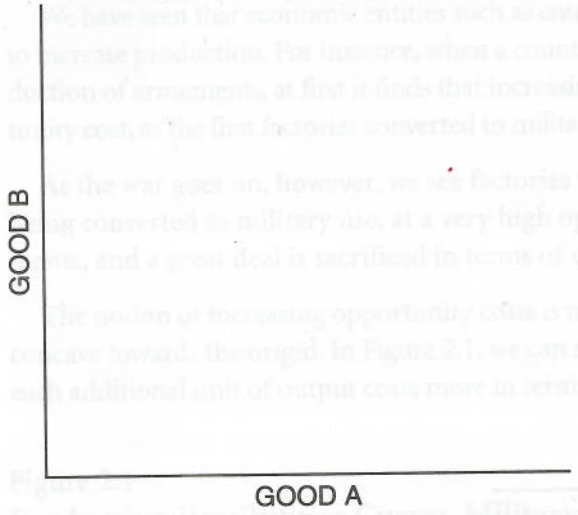
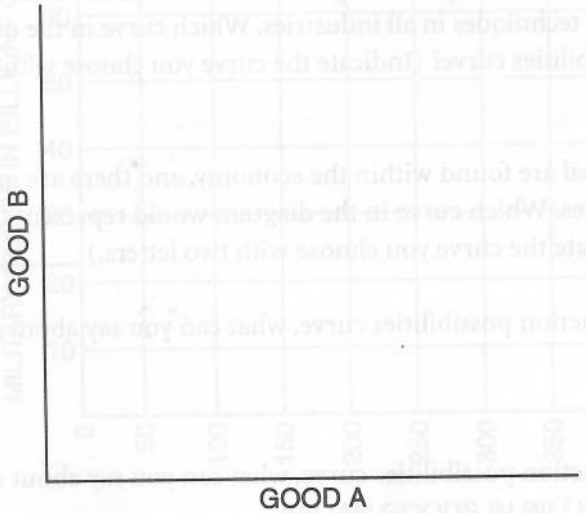


Figure 1.4

Production Possibilities Curve 4

Constant opportunity cost per unit of Good B

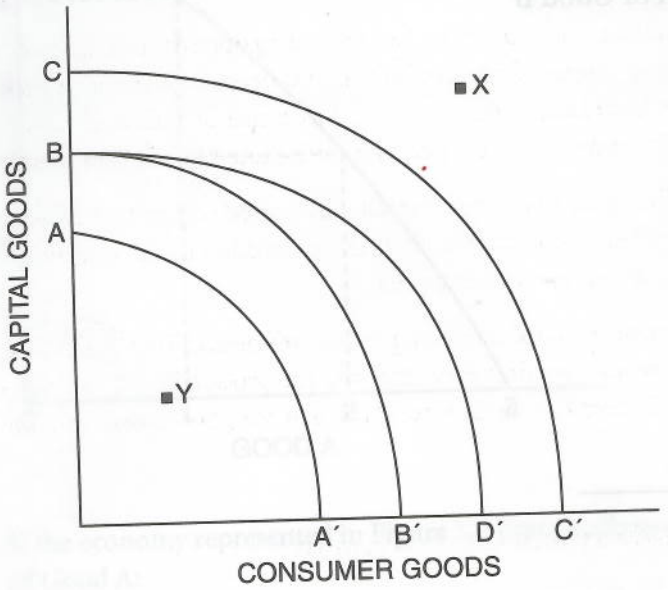


Part C

Use Figure 1.5 to answer the next five questions. Each question starts with Curve BB' as a country's production possibilities curve.

Figure 1.5

Production Possibilities Curve: Capital Goods and Consumer Goods



3. Suppose there is a major technological breakthrough in the consumer-goods industry, and the new technology is widely adopted. Which curve in the diagram would represent the new production possibilities curve? (Indicate the curve you choose with two letters.) _____

4. Suppose a new government comes into power and imposes a significant tax on the use of automated machinery and modern production techniques in all industries. Which curve in the diagram would represent the new production possibilities curve? (Indicate the curve you choose with two letters.) _____

5. Suppose massive new sources of oil and coal are found within the economy, and there are major technological innovations in both industries. Which curve in the diagram would represent the new production possibilities curve? (Indicate the curve you choose with two letters.) _____

6. If BB' represents a country's current production possibilities curve, what can you say about a point like X? (Write a brief statement.)

7. If BB' represents a country's current production possibilities curve, what can you say about a point like Y? (Write a brief statement.)

Opportunity Cost and Comparative Advantage

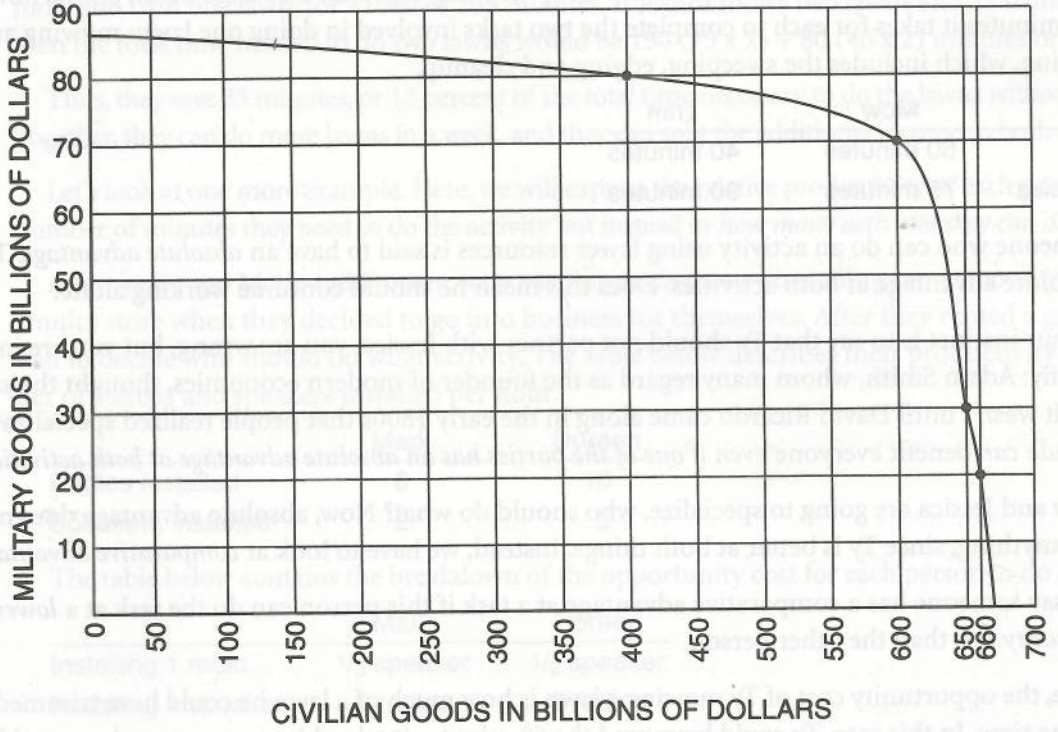
People who don't know much about economics often dismiss economics as being little more than cost/benefit analysis. While it is true that this is a very important concept, economics is not that simple. In fact, one of the most difficult concepts in economics is understanding the opportunity cost of choosing a particular action.

We have seen that economic entities such as countries often face *increasing* opportunity costs as they try to increase production. For instance, when a country finds itself at war and needs to increase its production of armaments, at first it finds that increasing military production comes at a relatively low opportunity cost, as the first factories converted to military use are generally well-suited for such an event.

As the war goes on, however, we see factories that are not at all well-suited to producing weapons being converted to military use, at a very high opportunity cost. Little is added to the output of armaments, and a great deal is sacrificed in terms of consumer goods.

The notion of increasing opportunity costs is manifested in a production possibilities curve that is concave towards the origin. In Figure 2.1, we can see that as we increase the production of military goods, each additional unit of output costs more in terms of civilian goods. When the government initially

Figure 2.1
Production Possibilities Curve: Military and Civilian Goods



Activity written by Ike Brannon, Joint Economic Committee, U.S. Senate, Washington, D.C.

increases the output of military goods from $20 billion to $30 billion, the opportunity cost (in terms of civilian goods forgone) is small: only $10 billion of military goods ($660 billion minus $650 billion).

However, when the country is already producing a lot of military goods and wants to produce even more, the cost is much higher. If the country is producing $70 billion and wants to produce $80 billion, the opportunity cost is now $200 billion, or $600 billion minus $400 billion.

Opportunity cost also explains the incredible amount of trade that goes on among individuals, firms and countries. Today, of course, few of us produce our own goods and services; we rely on others to do this while we use our time earning money at a job. Instead of making our goods, we buy them. Computer manufacturers actually produce few of their own parts, but instead buy parts from suppliers.

Countries tend to specialize in the production of goods and services as well; for instance, there aren't any firms in the United States currently making television sets, and we make very few consumer electronics of any sort. Instead, our businesses concentrate on making other goods and services, and we import the televisions we need.

As we will see, we benefit from trade with other countries even if we are better at producing *everything* than the other country. Trade will benefit both countries as long as we each specialize in doing the task for which we have a lower opportunity cost. This is called *comparative advantage.*

Part A: Examples

Let's begin with a simple example. One summer two friends, Ty and Jessica, each started a business, making money by providing lawn-care services. Although they earned decent money working alone, they wondered if they could make more money by working together. The table below shows how many minutes it takes for each to complete the two tasks involved in doing one lawn: mowing and trimming, which includes the sweeping, edging and cleanup.

	Mow	Trim
Ty	60 minutes	40 minutes
Jessica	75 minutes	90 minutes

Someone who can do an activity using fewer resources is said to have an *absolute advantage.* Ty has an absolute advantage at both activities. Does this mean he should continue working alone?

If your instinct is to say that Ty should not partner with Jessica, you are wrong, but you are in good company: Adam Smith, whom many regard as the founder of modern economics, thought the same thing. It wasn't until David Ricardo came along in the early 1800s that people realized specialization and trade *can* benefit everyone *even if one of the parties has an absolute advantage at both activities!*

If Ty and Jessica are going to specialize, who should do what? Now, absolute advantage does not tell us anything, since Ty is better at both things. Instead, we have to look at *comparative advantage.*

We say someone has a comparative advantage at a task if this person can do the task at a *lower opportunity cost* than the other person.

Here, the opportunity cost of Ty mowing a lawn is how much of a lawn he could have trimmed in the same time. In this case, Ty could have used the 60 minutes it takes him to mow one lawn and he could have trimmed $1\frac{1}{2}$ lawns, or $\frac{3}{2}$ lawns.

For Jessica, the opportunity cost of mowing one lawn is what she could have trimmed during the 75 minutes she needed to mow that lawn. Jessica could have trimmed only $^5/_6$ (or $^{75}/_{90}$) of a lawn. Thus, we can see that Jessica has a comparative advantage in mowing lawns because Jessica's opportunity cost of mowing a lawn is lower than Ty's: Five-sixths of a lawn trimmed is less than $^3/_2$ lawns trimmed.

Now, we can calculate their opportunity cost to *trim* lawns. It takes Ty 40 minutes to trim one lawn, and with these 40 minutes he could instead have mowed $^2/_3$ of a lawn (or $^{40}/_{60}$). For Jessica, instead of using 90 minutes to trim one lawn, she could have spent these 90 minutes mowing one lawn and $^1/_5$ of another lawn ($^{90}/_{75}$). Thus, Ty has a comparative advantage in trimming lawns. The table below shows the relative opportunity costs.

	Opportunity cost of mowing one lawn	Opportunity cost of trimming one lawn
Ty	$^3/_2$ lawn trimmed	$^2/_3$ lawn mowed
Jessica	$^5/_6$ lawn trimmed	$^6/_5$ lawn mowed

Notice two things about our calculation of opportunity cost: First, Ty's opportunity cost of mowing one lawn ($^3/_2$ lawns trimmed) is the reciprocal of his opportunity cost of trimming one lawn ($^2/_3$). This will always be true, so in this example we did twice as much math as we would normally have to.

Second, notice that each person has a comparative advantage in precisely one activity. Unless a person is equally able at both activities, this will always be true as well.

Next, let's see whether this specialization actually increases their productivity. Before specializing, it would take Jessica 165 minutes (90 + 75) to mow and trim one lawn and Ty 100 minutes (60 + 40) to mow and trim one lawn, for a total of 265 minutes. If Jessica mows two lawns and Ty trims two lawns, then the total time needed to do two lawns would be 150 (75 x 2) + 80 (40 x 2) minutes or 230 minutes.

Thus, they save 35 minutes, or 13 percent of the total time necessary to do the lawns without specializing. Together, they can do more lawns in a week, and they can split the additional income so both are richer.

Let's look at one more example. Here, we will express the relative productivity of each person not in the number of minutes they need to do the activity but instead in *how many activities they can do in an hour.*

A few years ago Mark and Doreen were earning extra money installing car stereos for a local electronics store when they decided to go into business for themselves. After they rented a garage, they had to decide who should do what activity. The table below describes their productivity in the number of stereos and speakers installed per hour.

	Mark	Doreen
Radios installed	6	10
Speakers installed	2	5

The table below contains the breakdown of the opportunity cost for each person to do each activity.

	Mark	Doreen
Installing 1 radio	$^1/_3$ speaker	$^1/_2$ speaker
Installing 1 speaker	3 radios	2 radios

Mark has the comparative advantage in installing radios, and Doreen has the comparative advantage in installing speakers. By specializing, their total output increases.

Part B: Questions

1. What is the difference between comparative advantage and absolute advantage?

2. You're given the following information about a newlywed couple and the time it takes each of them to do two different chores: vacuuming a room or washing a load of dishes.

	Mike	Debbie
Vacuum a room	60 minutes	45 minutes
Wash a load of dishes	30 minutes	45 minutes

(A) What is Mike's opportunity cost of vacuuming in terms of washing dishes?

(B) What is Mike's opportunity cost of washing dishes in terms of vacuuming?

(C) What is Debbie's opportunity cost of vacuuming in terms of washing dishes?

(D) What is Debbie's opportunity cost of washing dishes in terms of vacuuming?

(E) Who has the *absolute* advantage in vacuuming? _____

(F) Who has the *absolute* advantage in washing dishes? _____

(G) Who has the *comparative* advantage in vacuuming? _____

(H) Who has the *comparative* advantage in washing dishes? _____

(I) Who should do which chore and why? Base your answer only on the information above and on comparative advantage considerations.

3. Now, you're given the following information about Andy and Hannah and the time it takes each of them to clean an office and clean a jail cell:

	Andy	Hannah
Cleaning offices	60 minutes	20 minutes
Cleaning jail cells	30 minutes	15 minutes

(A) What is Andy's opportunity cost of cleaning offices in terms of cleaning jail cells?

(B) What is Hannah's opportunity cost of cleaning offices in terms of cleaning jail cells?

(C) What is Andy's opportunity cost of cleaning jail cells in terms of cleaning offices?

(D) What is Hannah's opportunity cost of cleaning jail cells in terms of cleaning offices?

(E) Who has the *absolute* advantage in cleaning offices? _____

(F) Who has the *absolute* advantage in cleaning jail cells? _____

(G) Who has the *comparative* advantage in cleaning offices? _____

(H) Who has the *comparative* advantage in cleaning jail cells? _____

(I) Who should do which chore and why? Base your answer only on the information above and on comparative advantage considerations.

4. Consider the following two countries. Assume they produce only these two goods. *Note that productivity is now measured in how many goods can be produced per hour*, the opposite of how we measured it in Questions 2 and 3.

	United States	Japan
Cars	12	10
Computers	4	6

(A) What is the United States' opportunity cost of making cars?

(B) What is Japan's opportunity cost of making cars?

(C) What is the United States' opportunity cost of making computers?

(D) What is Japan's opportunity cost of making computers?

(E) Which country has the *absolute* advantage in cars? _____

(F) Which country has the *absolute* advantage in computers? _____

(G) Which country has the *comparative* advantage in cars? _____

(H) Which country has the *comparative* advantage in computers? _____

(I) Which country should produce which good and why? Base your answer only on the information above and on comparative advantage considerations.

5. Use the law of comparative advantage to explain why self-sufficiency leads to a lower standard of living.

Demand Curves, Movements Along Demand Curves and Shifts in Demand Curves

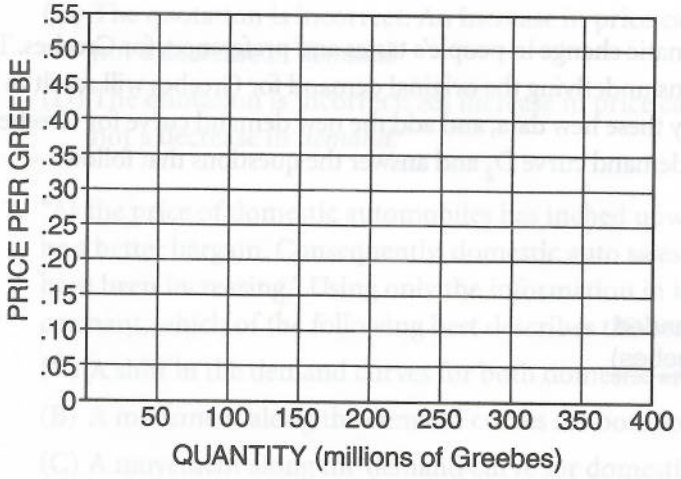
Part A

Figure 3.1 shows the market demand for a hypothetical product: Greebes. Study the data, and plot the demand for Greebes on the axes in Figure 3.2. Label the demand curve D, and answer the questions that follow. Write the correct answer in the answer blanks or underline the correct words in parentheses.

Figure 3.1
Demand for Greebes

Price ($ per Greebe)	Quantity Demanded (millions of Greebes)
$.10	350
.15	300
.20	250
.25	200
.30	150
.35	100
.40	50

Figure 3.2
Demand for Greebes



1. The data for demand curve D indicate that at a price of $0.30 per Greebe, buyers would be willing to buy _____ million Greebes. Other things constant, if the price of Greebes increased to $0.40 per Greebe, buyers would be willing to buy _____ million Greebes. Such a change would be a decrease in *(demand / quantity demanded)*. Other things constant, if the price of Greebes decreased to $0.20, buyers would be willing to buy _____ million Greebes. Such a change would be called an increase in *(demand / quantity demanded)*.

2. Now, let's suppose there is a dramatic change in federal income-tax rates that affects the disposable income of Greebe buyers. This change in the *ceteris paribus* (all else being equal) conditions underlying the original demand for Greebes will result in a new set of data, shown in Figure 3.3. Study these new data, and add the new demand curve for Greebes to the axes in Figure 3.2. Label the new demand curve D_1 and answer the questions that follow.

Figure 3.3
New Demand for Greebes

Price ($ per Greebe)	Quantity Demanded (millions of Greebes)
$.05	300
.10	250
.15	200
.20	150
.25	100
.30	50

3. Comparing the new demand curve (D_1) with the original demand curve (D), we can say that the change in the demand for Greebes results in a shift of the demand curve to the *(left / right)*.

   Such a shift indicates that at each of the possible prices shown, buyers are now willing to buy a *(smaller / larger)* quantity; and at each of the possible quantities shown, buyers are willing to offer a *(higher / lower)* maximum price. The cause of this demand curve shift was a(n) (*increase / decrease*) in tax rates that (*increased / decreased*) the disposable income of Greebe buyers.

4. Now, let's suppose that there is a dramatic change in people's tastes and preferences for Greebes. This change in the *ceteris paribus* conditions underlying the original demand for Greebes will result in a new set of data, shown in Figure 3.4. Study these new data, and add the new demand curve for Greebes to the axes in Figure 3.2. Label the new demand curve D_2 and answer the questions that follow.

Figure 3.4
New Demand for Greebes

Price ($ per Greebe)	Quantity Demanded (millions of Greebes)
$.20	350
.25	300
.30	250
.35	200
.40	150
.45	100
.50	50

   Comparing the new demand curve (D_2) with the original demand curve (D), we can say that the change in the demand for Greebes results in a shift of the demand curve to the *(left / right)*.

Such a shift indicates that at each of the possible prices shown, buyers are now willing to buy a *(smaller / larger)* quantity; and at each of the possible quantities shown, buyers are willing to offer a *(lower / higher)* maximum price. The cause of this shift in the demand curve was a(n) *(increase / decrease)* in people's tastes and preferences for Greebes.

Part B

Now, to test your understanding, underline the answer you think is the one best alternative in each of the following multiple-choice questions.

5. Other things constant, which of the following would *not* cause a change in the demand (shift in the demand curve) for mopeds?
   (A) A decrease in consumer incomes
   (B) A decrease in the price of mopeds
   (C) An increase in the price of bicycles, a substitute for mopeds
   (D) An increase in people's tastes and preferences for mopeds

6. "Rising oil prices have caused a sharp decrease in the demand for oil." Speaking precisely, and using terms as they are defined by economists, choose the statement that best describes this quotation.
   (A) The quotation is correct: An increase in price always causes a decrease in *demand.*
   (B) The quotation is incorrect: An increase in price always causes an increase in *demand,* not a decrease in *demand.*
   (C) The quotation is incorrect: An increase in price causes a decrease in the *quantity demanded,* not a decrease in *demand.*
   (D) The quotation is incorrect: An increase in price causes an increase in the *quantity demanded,* not a decrease in *demand.*

7. "As the price of domestic automobiles has inched upward, customers have found foreign autos to be a better bargain. Consequently, domestic auto sales have been decreasing, and foreign auto sales have been increasing." Using only the information in this quotation and assuming everything else constant, which of the following best describes this statement?
   (A) A shift in the demand curves for both domestic and foreign automobiles
   (B) A movement along the demand curves for both foreign and domestic automobiles
   (C) A movement along the demand curve for domestic autos, and a shift in the demand curve for foreign autos
   (D) A shift in the demand curve for domestic autos, and a movement along the demand curve for foreign autos

8. You hear a fellow student say: "Economic markets are like a perpetual see-saw. If demand rises, the price rises; if price rises, then demand will fall. If demand falls, price will fall; if price falls, demand will rise and so on forever." Dispel your friend's obvious confusion in no more than one short paragraph below.

Reasons for Changes in Demand

Part A

Read the eight newspaper headlines in Figure 4.2, and use the table to record the impact, if any, of each event on the demand for beef. Use the first column to the right of the headline to show whether the event causes a change in demand. Use the next column to record whether the change is an increase or a decrease in demand. In the third column, decide whether the demand curve shifts left or right. Finally, write the letter for the new demand curve. Use Figure 4.1 to help you. **Always start at curve B,** and move only one curve at a time. One headline implies that the demand for beef does not change.

Figure 4.1

Beef Consumption in May

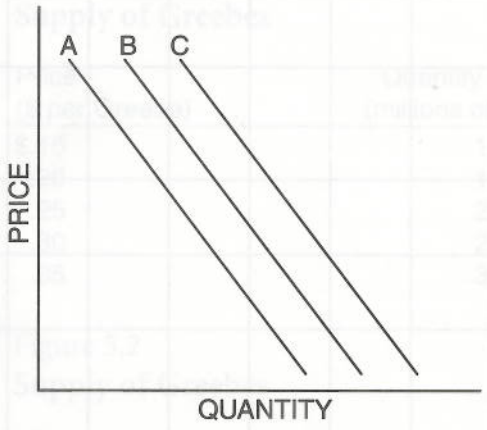


Figure 4.2

Headline	Demand Shift? (Y / N)	If Demand Shifts, Inc / Dec	Curve Shifts Left / Right	New Curve
1. Price of Beef to Rise in June				
2. Millions of Immigrants Swell U.S. Population				
3. Pork Prices Drop				
4. Surgeon General Warns That Eating Beef Is Hazardous to Health				
5. Beef Prices Fall; Consumers Buy More				
6. Real Income for U.S. Drops for Third Month				
7. Charcoal Shortage Threatens Memorial Day Cookouts				
8. Nationwide Fad: The Disco-Burger				

Based on an activity from *Master Curriculum Guide in Economics: Teaching Strategies for High School Economics Courses* (New York: National Council on Economic Education, 1985), p. 68.

Part B

Categorize each change in demand in Part A according to the reason why demand changed. A given demand curve assumes that consumer expectations, consumer tastes and preferences, the number of consumers in the market, the income of consumers, and the prices of substitutes and complements are unchanged. In the table below, place an X next to the reason that the event described in the headline caused a change in demand. One headline will have no answer because it is a change in quantity demanded.

Figure 4.3

↓ Reason / Headline Number →	1	2	3	4	5	6	7	8
A change in consumer expectations								
A change in consumer tastes								
A change in the number of consumers in the market								
A change in income								
A change in the price of a substitute good								
A change in the price of a complementary good								

Supply Curves, Movements Along Supply Curves and Shifts in Supply Curves

In this activity and those that follow, we will assume that the long-run supply curve of Greebes is typically upward sloping.

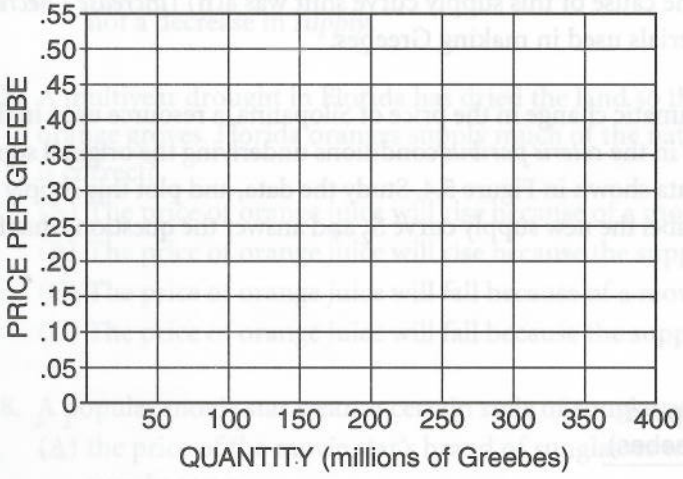
Part A

Study the data in Figure 5.1 and plot the supply of Greebes on the axes in Figure 5.2. Label the supply curve S and answer the questions that follow. Write the correct answer on the answer blank, or underline the correct answer in parentheses.

Figure 5.1
Supply of Greebes

Price ($ per Greebe)	Quantity Supplied (millions of Greebes)
$.15	100
.20	150
.25	200
.30	250
.35	300

Figure 5.2
Supply of Greebes



1. The data for supply curve S indicate that at a price of $0.25 per Greebe, suppliers would be willing to offer _____ million Greebes. Other things constant, if the price of Greebes increased to $0.30 per Greebe, suppliers would be willing to offer _____ million Greebes. Such a change would be an increase in *(supply / quantity supplied)*.

Other things constant, if the price of Greebes decreased to $0.20 per Greebe, suppliers would be willing to offer _____ million Greebes. Such a change would be called a decrease in *(supply / quantity supplied)*.

2. Now, let's suppose that there is a dramatic change in the price of several of the raw materials used in making Greebes. This change in the *ceteris paribus* conditions underlying the original supply of Greebes will result in a new set of data, such as that shown in Figure 5.3. Study the data, and plot this supply of Greebes on the axes in Figure 5.2. Label the new supply curve S_1 and answer the questions that follow.

Figure 5.3
New Supply of Greebes

Price ($ per Greebe)	Quantity Supplied (millions of Greebes)
$.20	50
.25	100
.30	150
.35	200
.40	250

3. Comparing the new supply curve (S_1) with the original supply curve (S), we can say that a change in the supply of Greebes results in a shift of the supply curve to the *(left / right)*. Such a shift indicates that at each of the possible prices shown, suppliers are now willing to offer a *(smaller / larger)* quantity; and at each of the possible quantities shown, suppliers are willing to accept a *(higher / lower)* minimum price. The cause of this supply curve shift was a(n) *(increase / decrease)* in prices of several of the raw materials used in making Greebes.

4. Now, let's suppose that there is a dramatic change in the price of Silopanna, a resource used in the production of Greebes. This change in the *ceteris paribus* conditions underlying the original supply of Greebes will result in a new set of data shown in Figure 5.4. Study the data, and plot this supply of Greebes on the axes in Figure 5.2. Label the new supply curve S_2 and answer the questions that follow.

Figure 5.4
New Supply of Greebes

Price ($ per Greebe)	Quantity Supplied (millions of Greebes)
$.10	150
.15	200
.20	250
.25	300
.30	350

Comparing the new supply curve (S_2) with the original supply curve (S), we can say that the change in the supply of Greebes results in a shift of the supply curve to the *(left / right)*. Such a shift indi-

cates that at each of the possible prices shown, suppliers are now willing to offer a *(smaller / larger)* quantity; and at each of the possible quantities shown, suppliers are willing to accept a *(lower / higher)* minimum price. The cause of this supply curve shift is a(n) *(increase / decrease)* in the price of Silopanna, a resource used in the production of Greebes.

Part B

Now, to check your understanding, underline the answer you think is the one best alternative in each of the following multiple-choice questions.

5. Other things constant, which of the following would *not* cause a change in the long-run supply of beef?
   (A) A decrease in the price of beef
   (B) A decrease in the price of cattle feed
   (C) An increase in the price of cattle feed
   (D) An increase in the cost of transporting cattle to market

6. "Falling oil prices have caused a sharp decrease in the supply of oil." Speaking precisely, and using terms as they are defined by economists, choose the statement that best describes this quotation.
   (A) The quotation is correct: A decrease in price always causes a decrease in *supply*.
   (B) The quotation is incorrect: A decrease in price always causes an increase in *supply*, not a decrease in *supply*.
   (C) The quotation is incorrect: A decrease in price causes an increase in the *quantity supplied*, not a decrease in *supply*.
   (D) The quotation is incorrect: A decrease in price causes a decrease in the *quantity supplied*, not a decrease in *supply*.

7. A multiyear drought in Florida has dried the land so that rampant wildfires have destroyed many orange groves. Florida oranges supply much of the nation's orange juice. Which statement below is correct?
   (A) The price of orange juice will rise because of a movement up the supply curve.
   (B) The price of orange juice will rise because the supply curve will shift to the left.
   (C) The price of orange juice will fall because of a movement down the supply curve.
   (D) The price of orange juice will fall because the supply curve will shift to the right.

8. A popular movie star wears a certain style of sunglasses. If her fans want to copy her look,
   (A) the price of the movie star's brand of sunglasses will rise because of a movement up the supply curve.
   (B) the price of the movie star's brand of sunglasses will rise because the supply curve will shift to the left.
   (C) the price of the movie star's brand of sunglasses will fall because of a movement down the supply curve.
   (D) the price of the movie star's brand of sunglasses will fall because the supply curve will shift to the right.

Reasons for Changes in Supply

Part A

Read the eight newspaper headlines in Figure 6.2, and record the impact, if any, of each event on the supply of cars. Use the first column to the right of the headline to show whether the event will cause a change in supply. Use the next column to record whether the change is an increase or a decrease in supply. In the third column, decide whether the supply curve shifts left or right. Finally, write the letter for the new supply curve. Use Figure 6.1 to help you. **Always start at curve B,** and move only one curve at a time. Two headlines imply that the supply of cars does not change.

Figure 6.1
Supply of Foreign and Domestic Cars

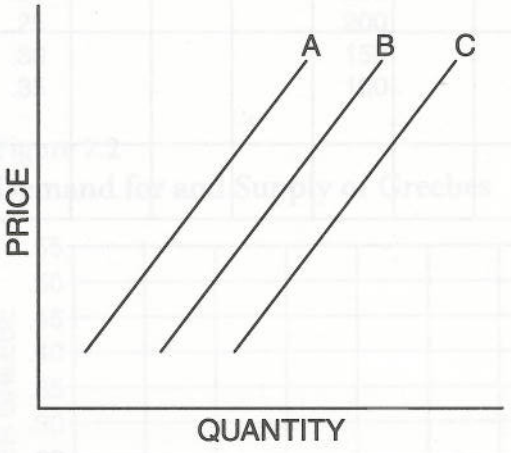


Figure 6.2

Headline	Supply Shift? (Y / N)	If Supply Shifts, Inc / Dec	Curve Shifts Left / Right	New Curve
1. Auto Workers' Union Agrees to Wage Cuts				
2. New Robot Technology Increases Efficiency				
3. Nationwide Auto Strike Began at Midnight				
4. New Import Quotas Reduce Foreign Car Imports				
5. Cost of Steel Rises				
6. Auto Producer Goes Bankrupt; Closes Operation				
7. Buyers Reject New Models				
8. National Income Rises 2%				

From *Master Curriculum Guide in Economics: Teaching Strategies for High School Economics Courses* (New York: National Council on Economic Education, 1985), p. 69

Part B

Categorize each change in supply in Part A according to the reason why supply changed. In Figure 6.3, place an X next to the reason that the event described in the headline caused a change in supply. In some cases, more than one headline could be matched to a reason. Two headlines do not indicate a shift in supply.

Figure 6.3

↓ Reason — Headline Number →	1	2	3	4	5	6	7	8
A change in costs of inputs to production process								
A change in technology								
A change in the number of producers in the market								
Government policies								

Equilibrium Price and Equilibrium Quantity

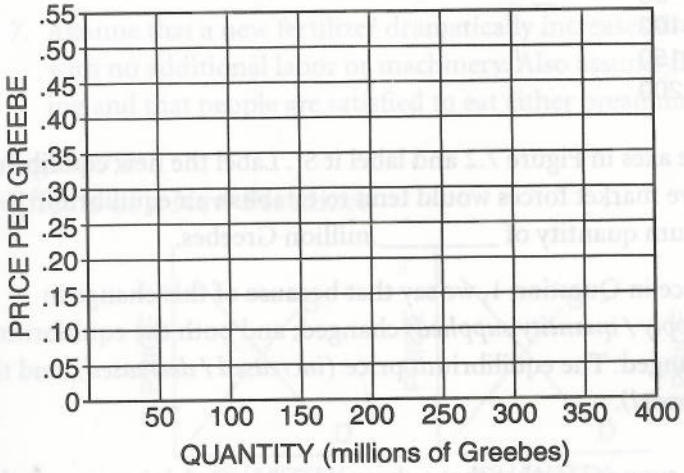
Part A

Figure 7.1 below shows the demand for Greebes and the supply of Greebes. Plot these data on the axes in Figure 7.2. Label the demand curve D and label the supply curve S. Then answer the questions that follow. Fill in the answer blanks, or underline the correct answer in parentheses.

Figure 7.1
Demand for and Supply of Greebes

Price ($ per Greebe)	Quantity Demanded (millions of Greebes)	Quantity Supplied (millions of Greebes)
$.15	300	100
.20	250	150
.25	200	200
.30	150	250
.35	100	300

Figure 7.2
Demand for and Supply of Greebes



1. Under these conditions, competitive market forces would tend to establish an equilibrium price of _____ per Greebe and an equilibrium quantity of _____ million Greebes.

2. If the price currently prevailing in the market is $0.30 per Greebe, buyers would want to buy _____ million Greebes and sellers would want to sell _____ million Greebes. Under these conditions, there would be a (*shortage / surplus*) of _____ million Greebes. Competitive market forces would tend to cause the price to (*increase / decrease*) to a price of _____ per Greebe.

   At this new price, buyers would now want to buy _____ million Greebes, and sellers now want to sell _____ million Greebes. Because of this change in (*price / underlying conditions*),

the (*demand / quantity demanded*) changed by _____ million Greebes, and the (*supply / quantity supplied*) changed by _____ million Greebes.

3. If the price currently prevailing in the market is $0.20 per Greebe, buyers would want to buy _____ million Greebes, and sellers would want to sell _____ million Greebes. Under these conditions, there would be a *(shortage / surplus)* of _____ million Greebes. Competitive market forces would tend to cause the price to *(increase / decrease)* to a price of _____ per Greebe. At this new price, buyers would now want to buy _____ million Greebes, and sellers now want to sell _____ million Greebes. Because of this change in *(price / underlying conditions)*, the *(demand / quantity demanded)* changed by _____ million Greebes, and the *(supply / quantity supplied)* changed by _____ million Greebes.

4. Now, suppose a mysterious blight causes the supply schedule for Greebes to change to the following:

Figure 7.3
New Supply of Greebes

Price ($ per Greebe)	Quantity Supplied (millions of Greebes)
$.20	50
.25	100
.30	150
.35	200

Plot the new supply schedule on the axes in Figure 7.2 and label it S_1. Label the new equilibrium E_1. Under these conditions, competitive market forces would tend to establish an equilibrium price of _____ per Greebe and an equilibrium quantity of _____ million Greebes.

Compared with the equilibrium price in Question 1, we say that because of this change in *(price / underlying conditions)*, the *(supply / quantity supplied)* changed; and both the equilibrium price and the equilibrium quantity changed. The equilibrium price *(increased / decreased)*, and the equilibrium quantity *(increased / decreased)*.

5. Now, with the supply schedule at S_1, suppose further that a sharp drop in people's incomes as the result of a prolonged recession causes the demand schedule to change to the following:

Figure 7.4
New Demand for Greebes

Price ($ per Greebe)	Quantity Demanded (millions of Greebes)
$.15	200
.20	150
.25	100
.30	50

Plot the new demand schedule on the axes in Figure 7.2 and label it D_1. Label the new equilibrium E_2. Under these conditions, with the supply schedule at S_1, competitive market forces would tend to establish an equilibrium price of _____ per Greebe and an equilibrium quantity of _____ million Greebes. Compared with the equilibrium price in Question 4, because of this change in *(price / underlying conditions)*, the *(demand / quantity demanded)* changed. The equilibrium price *(increased / decreased)*, and the equilibrium quantity *(increased / decreased)*.

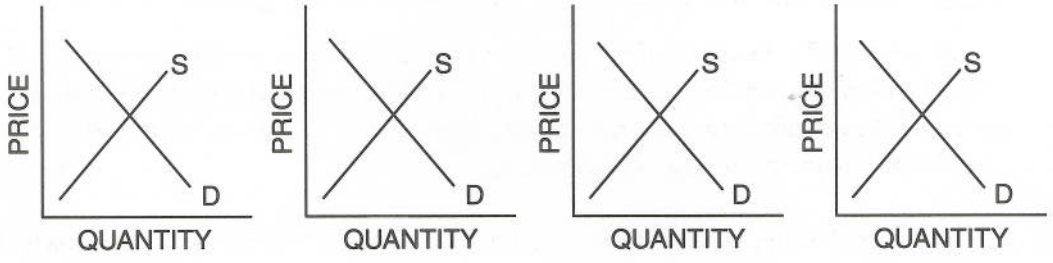
6. The movement from the first equilibrium price and quantity to the new equilibrium price and quantity is the result of a *(price / nonprice)* effect.

Part B

The following questions refer to a group of related markets in the United States during a given time period. Assume that the markets are perfectly competitive and that the supply and demand model is completely applicable. The figures show the supply and demand in each market *before* the assumed change occurs. Trace through the effects of the assumed change, *other things constant.* Work your way from left to right. Shift only one curve in each market. For each market, draw whatever new supply or demand curves are needed, labeling each new curve S_1 or D_1. Then circle the correct symbol under each diagram (↑ for increase, — for unchanged, and ↓ for decrease). Remember to shift only one curve in each market.

7. Assume that a new fertilizer dramatically increases the amount of wheat that can be harvested with no additional labor or machinery. Also assume that this fertilizer does not affect potato farming and that people are satisfied to eat either bread made from wheat flour or potatoes.

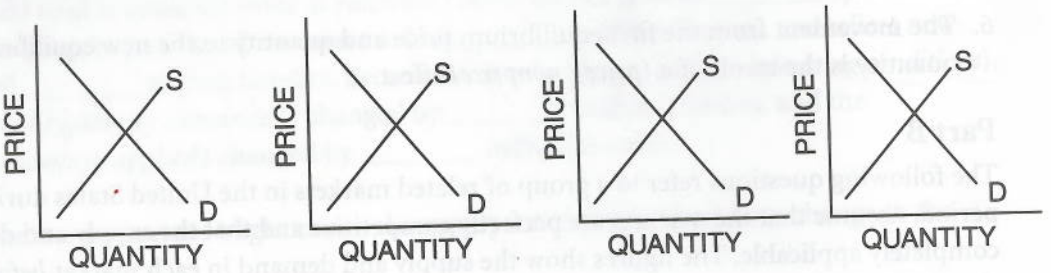
Figure 7.5
Effects of a New Fertilizer



	Wheat	Bread	Potatoes	Wheat Harvesting Machinery
Demand:	↑ — ↓	↑ — ↓	↑ — ↓	↑ — ↓
Supply:	↑ — ↓	↑ — ↓	↑ — ↓	↑ — ↓
Equilibrium price:	↑ — ↓	↑ — ↓	↑ — ↓	↑ — ↓
Equilibrium quantity:	↑ — ↓	↑ — ↓	↑ — ↓	↑ — ↓

8. Assume that a heavy frost destroys half the world's coffee crop and that people use more cream in coffee than they do in tea.

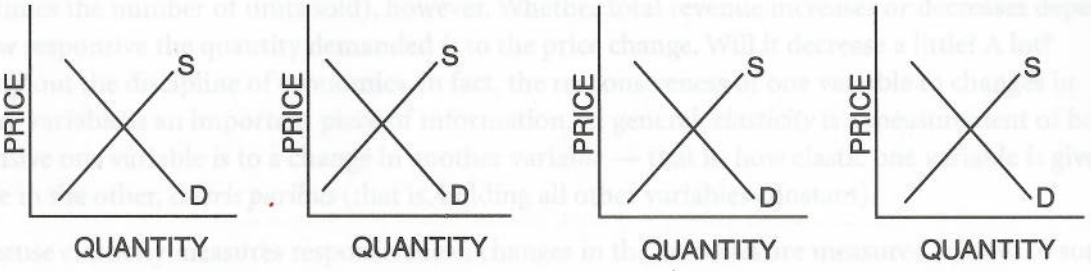
Figure 7.6
Effects of a Loss of Coffee Crop



	Coffee	Tea	Cream	Automatic Coffee Makers
Demand:	↑ — ↓	↑ — ↓	↑ — ↓	↑ — ↓
Supply:	↑ — ↓	↑ — ↓	↑ — ↓	↑ — ↓
Equilibrium price:	↑ — ↓	↑ — ↓	↑ — ↓	↑ — ↓
Equilibrium quantity:	↑ — ↓	↑ — ↓	↑ — ↓	↑ — ↓

9. Assume beef and pork are perfect substitutes. The price of pork rises dramatically. Catsup is a complement to beef; mustard is a complement to pork.

Figure 7.7
Effects of a Change in the Price of Pork



	Beef	Feed for Cattle	Catsup	Mustard
Demand:	↑ — ↓	↑ — ↓	↑ — ↓	↑ — ↓
Supply:	↑ — ↓	↑ — ↓	↑ — ↓	↑ — ↓
Equilibrium price:	↑ — ↓	↑ — ↓	↑ — ↓	↑ — ↓
Equilibrium quantity:	↑ — ↓	↑ — ↓	↑ — ↓	↑ — ↓

Elasticity: An Introduction

In many circumstances, it is not enough for an economist, policymaker, firm or consumer to simply know the direction in which a variable will be moving. For example, if I am a producer, the law of demand tells me that if I increase the price of my good, the quantity demanded by consumers will decrease. The law of demand doesn't tell me what will happen to my total revenue (the price of the good times the number of units sold), however. Whether total revenue increases or decreases depends on how responsive the quantity demanded is to the price change. Will it decrease a little? A lot? Throughout the discipline of economics, in fact, the responsiveness of one variable to changes in another variable is an important piece of information. In general, *elasticity* is a measurement of how responsive one variable is to a change in another variable — that is, how elastic one variable is given a change in the other, *ceteris paribus* (that is, holding all other variables constant).

Because elasticity measures responsiveness, changes in the variables are measured relative to some base or starting point. Consider the following elasticity measurements:

The price elasticity of demand, ε_d:

$$\varepsilon_d = \frac{\textit{percentage change in quantity demanded}}{\textit{percentage change in price}}$$

The income elasticity of demand, ε_d:

$$\varepsilon_d = \frac{\textit{percentage change in quantity demanded}}{\textit{percentage change in income}}$$

The price elasticity of supply, ε_s:

$$\varepsilon_s = \frac{\textit{percentage change in quantity supplied}}{\textit{percentage change in price}}$$

The wage elasticity of labor supply, ε_{ls}:

$$\varepsilon_{ls} = \frac{\textit{percentage change in quantity of labor supplied}}{\textit{percentage change in wage}}$$

Activity written by Kelly A. Chaston, Davidson College, Davidson, N.C.

Part A
Problems Involving Extra Credit

1. Now, suppose that your economics teacher currently allows you to earn extra credit by submitting answers to the end-of-the-chapter questions in your textbook. The number of questions you're willing to submit depends on the amount of extra credit for each question. How responsive you are to a change in the extra-credit points the teacher gives can be represented as an *elasticity*. Write the formula for the elasticity of extra-credit problems submitted:

$$\varepsilon_{ps} = \_\_\_\_\_$$

2. Now, consider that your teacher's goal is to get you to submit twice as many questions: a 100-percent increase. Underline the correct answer in parentheses.

   (A) If the number of chapter-end questions you submit *is* very responsive to a change in extra-credit points, then a given increase in extra credit elicits a large increase in questions submitted. In this case, your teacher will need to increase the extra-credit points by (*more than / less than / exactly*) 100 percent.

   (B) If the number of chapter-end questions you submit *is not* very responsive to a change in extra-credit points, then a given increase in extra credit elicits a small increase in questions submitted. In this case, your teacher will need to increase the extra-credit points by (*more than / less than / exactly*) 100 percent.

Part B

The Price Elasticity of Demand

It's easy to imagine that there are many applications for the elasticity concept. Here we will concentrate on the price elasticity of demand for goods and services. For convenience, the measure is repeated here:

$$\varepsilon_d = \frac{\textit{percentage change in quantity demanded}}{\textit{percentage change in price}}$$

Note the following points:

- Price elasticity of demand is always measured *along* a demand curve. When measuring the responsiveness of quantity demanded to a change in price, all other variables must be held constant.
- The price elasticity of demand is typically reported as a positive number, even though the calculation itself is negative; price and quantity demanded move in opposite directions.
- Along a linear demand curve, there are price ranges over which demand is elastic, unit elastic and inelastic.

Figure 8.1

Relationship Between Changes in Quantity Demanded and Price

Percentage change in quantity demanded > percentage change in price	> 1	Elastic
Percentage change in quantity demanded = percentage change in price	= 1	Unit elastic
Percentage change in quantity demanded < percentage change in price	< 1	Inelastic

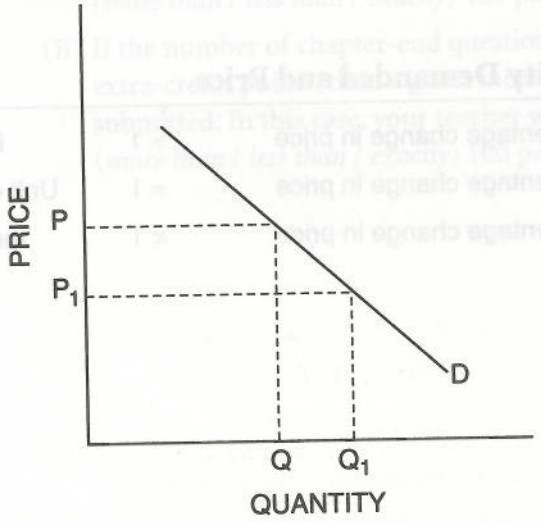
Part C
Calculating the Arc Elasticity Coefficient

The arc elasticity calculation method is obtained when the midpoint or average price and quantity are used in the calculation. This is reflected in the formula below.

$$\varepsilon_d = \frac{\textit{percentage change in quantity demanded}}{\textit{percentage change in price}} = \frac{\dfrac{Q - Q_1}{(Q + Q_1)/2}}{\dfrac{P - P_1}{(P + P_1)/2}} = \frac{\dfrac{\Delta Q}{(Q + Q_1)/2}}{\dfrac{\Delta P}{(P + P_1)/2}}$$

If we have the consumer or market demand curves, we can precisely calculate the arc elasticity value, or coefficient. Suppose that price is increased (decreased) from P to P_1 and so quantity demanded decreases (increases) from Q to Q_1.

Figure 8.2
Calculating the Arc Elasticity Coefficient



By making all numbers positive, we've in effect taken the absolute values of these changes, and so the elasticity coefficient will be positive. Note that we have used the average of the two prices and the two quantities. We have done this so that the elasticity measured will be the same whether we are moving from Q to Q_1 or the other way around.

Part D
Problems Involving Coffee

Suppose Moonbucks, a national coffee-house franchise, finally moves into the little town of Middleofnowhere. Moonbucks is the only supplier of coffee in town and faces the following demand schedule each week. Write the correct answer on the answer blanks, or underline the correct answer in parentheses.

Figure 8.3
Cups of Coffee Demanded per Week

Price (per cup)	Quantity Demanded
$6	80
5	100
4	120
3	140
2	160
1	180
0	200

3. What is the arc price elasticity of demand when the price changes from $1 to $2? _____

$$\varepsilon_d = \frac{\frac{\Delta Q}{(Q + Q_1)/2}}{\frac{\Delta P}{(P + P_1)/2}} = \frac{\_\_\_\_}{\_\_\_\_} = \_\_\_\_$$

So, over this range of prices, demand is (*elastic / unit elastic / inelastic*).

4. What is the arc price elasticity of demand when the price changes from $5 to $6? _____

$$\varepsilon_d = \frac{\frac{\Delta Q}{(Q + Q_1)/2}}{\frac{\Delta P}{(P + P_1)/2}} = \frac{\_\_\_\_}{\_\_\_\_} = \_\_\_\_$$

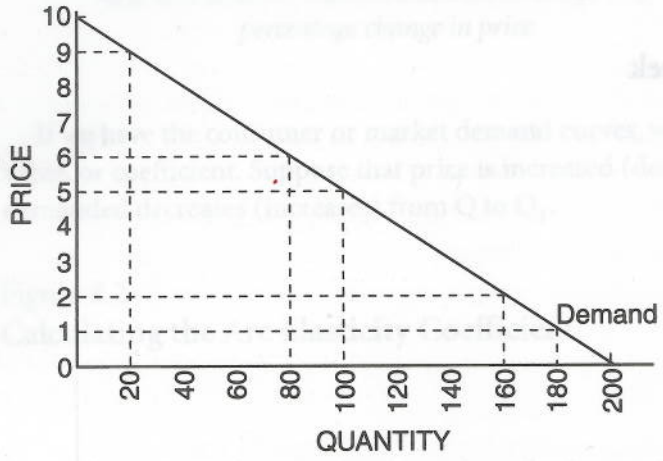
So, over this range of prices, demand is (*elastic / unit elastic / inelastic).*

Note: Because the relationship between quantity demanded and price is inverse, price elasticity of demand would always be negative. Economists believe using negative numbers is confusing when referring to "large" or "small" elasticities of demand. Therefore, they use absolute or positive numbers, changing the sign on the negative numbers.

Part E

Now, consider Figure 8.4, which graphs the demand schedule given in Figure 8.3. Recall the slope of a line is measured by the rise over the run: slope = rise / run = $\Delta P / \Delta Q$.

Figure 8.4
Elasticity of Demand for Coffee



5. Using your calculations of ΔP and ΔQ from Question 3, calculate the slope of the demand curve.

_____

6. Using your calculations of ΔP and ΔQ from Question 4, calculate the slope of the demand curve.

_____

7. The law of demand tells us that an increase in price results in a decrease in the quantity demanded. Questions 5 and 6 remind us that the slope of a straight line is *constant everywhere along the line.* Along this demand curve, a change in price of $1 generates a change in quantity demanded of 20 cups of coffee a week.

   You've now shown mathematically that while the slope of the demand curve is related to elasticity, the two concepts are not the same thing. Briefly discuss the relationship between where you are along the demand curve and the elasticity of demand. How does this tie into the notion of *responsiveness*?

Sample Multiple-Choice Questions

Circle the letter of each correct answer.

1. The crucial problem of economics is
   (A) establishing a fair tax system.
   (B) providing social goods and services.
   (C) developing a price mechanism that reflects the relative scarcities of products and resources.
   (D) allocating scarce productive resources to satisfy wants.
   (E) enacting a set of laws that protects resources from overuse.

2. When one decision is made, the next best alternative not selected is called
   (A) economic resource.
   (B) opportunity cost.
   (C) scarcity.
   (D) comparative disadvantage.
   (E) production.

3. Which of the following is true if the production possibilities curve is a curved line concave to the origin?
   (A) Resources are perfectly substitutable between the production of the two goods.
   (B) It is possible to produce more of both products.
   (C) Both products are equally capable of satisfying consumer wants.
   (D) The prices of the two products are the same.
   (E) As more of one good is produced, more and more of the other good must be given up.

4. Which of the following is true of the concept of increasing opportunity cost?
   (A) It is unimportant in command economies because of central planning.
   (B) It suggests that the use of resources to produce a set of goods and services means that as more of one is produced, some of the other must be sacrificed.
   (C) It is irrelevant if the production possibilities curve is convex to the origin.
   (D) It suggests that unlimited wants can be fulfilled.
   (E) It means that resources are plentiful and opportunities to produce greater amounts of goods and services are unlimited.

5. To be considered scarce, an economic resource must be which of the following?
   I. Limited
   II. Free
   III. Desirable
   (A) I only
   (B) I and II only
   (C) II and III only
   (D) I and III only
   (E) I, II and III

6. The basic economic problem is reflected in which of the following concepts?
   I. Opportunity cost
   II. Production possibilities
   III. The fallacy of composition
   IV. *Ceteris paribus*
   (A) I only
   (B) IV only
   (C) I and II only
   (D) II and III only
   (E) II, III and IV only

7. Which of the following goods would be considered scarce?
   I. Education
   II. Gold
   III. Time
   (A) I only
   (B) II only
   (C) III only
   (D) I and II only
   (E) I, II and III

8. The value of the best alternative forgone when a decision is made defines
   (A) economic good.
   (B) opportunity cost.
   (C) scarcity.
   (D) trade-off.
   (E) comparative advantage.

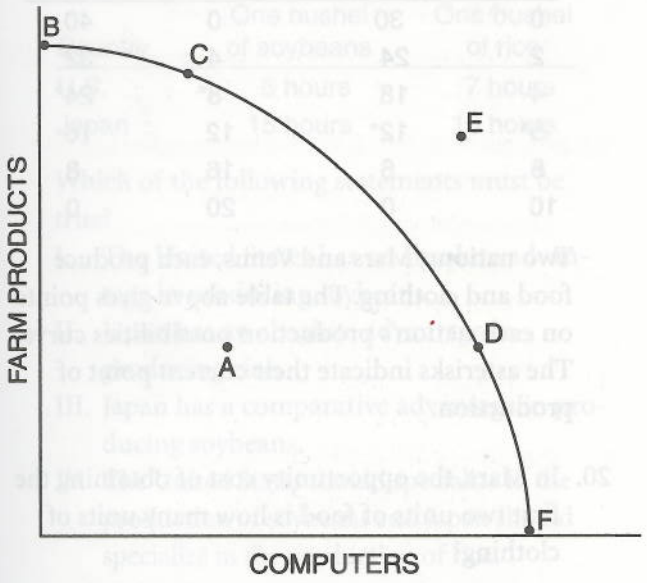
9. Which of the following problems do all economic systems face?
   I. How to allocate scarce resources among unlimited wants
   II. How to distribute income equally among all the citizens
   III. How to decentralize markets
   IV. How to decide what to produce, how to produce and for whom to produce
   (A) I only
   (B) I and IV only
   (C) II and III only
   (D) I, II and III only
   (E) I, II, III and IV

10. The opportunity cost of building a new high school is
    (A) the expense of hiring more teachers for the new high school.
    (B) the expense of new desks, chalkboards and books for the the new high school.
    (C) other goods and services, which must now be sacrificed to build the new high school.
    (D) overcrowded classrooms.
    (E) the bond levy needed to build the new high school.

11. In which way does a straight line production possibilities curve differ from a concave production possibilities curve?
    (A) A straight line production possibilities curve has a decreasing opportunity cost.
    (B) A straight line production possibilities curve has a constant opportunity cost.
    (C) A straight line production possibilities curve has an increasing opportunity cost.
    (D) A straight line production possibilities curve does not show opportunity cost.
    (E) There is no difference between the two production possibilities curves.

12. The law of increasing opportunity cost is reflected in the shape of the
    (A) production possibilities curve concave to the origin.
    (B) production possibilities curve convex to the origin.
    (C) horizontal production possibilities curve.
    (D) straight-line production possibilities curve.
    (E) upward-sloping production possibilities curve.

Use the figure below for questions 13 through 16. It shows the production possibilities curve for a country with full employment of a given-size labor force.



13. If the country is currently producing at Point C, it can produce more computers by doing which of the following?
    (A) Moving to Point A
    (B) Moving to Point B
    (C) Moving to Point D
    (D) Moving to Point E
    (E) Remaining at Point C, since computer production is maximized

14. Which of the following statements about the production possibilities curve is true?
    (A) Point A is not attainable in a developed society.
    (B) Point D is not attainable given the society's resources.
    (C) The relative position of Points C and D reflect production alternatives rather than relative prices.
    (D) Elimination of unemployment will move the production possibilities curve to the right, closer to Point E.
    (E) Point E lies outside the production possibilities curve because it represents a combination of resources not desired by the citizens of the country.

15. How might Point E be attained?
    (A) If the country's resources were more fully employed
    (B) If the country's resources were shifted to encourage more efficient use of scarce resources
    (C) If improvements in technology occurred in either the computer sector or the farm-products sector
    (D) If firms decreased their output of computers
    (E) If the nation used more of its scarce resources to produce farm products

16. Which of the following points would most likely lead to a rightward shift of the production possibilities curve over time?
    (A) Point A
    (B) Point B
    (C) Point C
    (D) Point D
    (E) Point E

17. The opportunity cost of producing an additional unit of product A is
    (A) all of the human and capital resources used to produce product A.
    (B) the retail price paid for product A.
    (C) the wholesale price of product A.
    (D) the amount of product B that cannot now be produced because of product A.
    (E) the profit that was earned from producing product A.

18. Which of the following would cause a leftward shift of the production possibilities curve?
    (A) An increase in unemployment
    (B) An increase in inflation
    (C) An increase in capital equipment
    (D) A decrease in consumer demand
    (E) A decrease in working-age population

19. Which of the following would cause an outward or rightward shift in the production possibilities curve?
    (A) An increase in unemployment
    (B) An increase in inflation
    (C) An increase in capital equipment
    (D) A decrease in natural resources
    (E) A decrease in the number of workers

Use the following table for questions 20, 21 and 22.

Mars		Venus	
Food	Clothing	Food	Clothing
0	30	0	40
2	24	4	32
4	18	8*	24*
5*	12*	12	16
8	6	16	8
10	0	20	0

Two nations, Mars and Venus, each produce food and clothing. The table above gives points on each nation's production possibilities curve. The asterisks indicate their current point of production.

20. In Mars, the opportunity cost of obtaining the first two units of food is how many units of clothing?
    (A) 2 (B) 3
    (C) 6 (D) 8
    (E) 12

21. In Venus, the opportunity cost of the first unit of
    (A) food is two units of clothing.
    (B) food is eight units of clothing.
    (C) clothing is two units of food.
    (D) clothing is four units of food.
    (E) clothing is eight units of food.

22. Which of the following statements is correct based on the concept of comparative advantage?
    (A) Mars and Venus should continue producing the quantities indicated by the asterisks.
    (B) Mars should specialize in the production of food.
    (C) Mars should specialize in the production of clothing.
    (D) Venus has the comparative advantage in clothing.
    (E) Mars has an absolute advantage in the production of food.

23. The table below shows the number of hours needed to produce one bushel of soybeans and one bushel of rice in each of two countries.

Country	One bushel of soybeans	One bushel of rice
U.S.	5 hours	7 hours
Japan	15 hours	10 hours

Which of the following statements must be true?

I. The United States has an absolute advantage in producing soybeans.
II. Japan has an absolute advantage in producing rice.
III. Japan has a comparative advantage in producing soybeans.
IV. The United States should specialize in the production of soybeans and Japan should specialize in the production of rice.

(A) I only
(B) III only
(C) I and IV only
(D) II and IV only
(E) I, II, III and IV

24. If there is an increase in demand for a good, what will most likely happen to the price and quantity of the good exchanged?

	Price	Quantity
(A)	Increase	Increase
(B)	Increase	Decrease
(C)	Decrease	Decrease
(D)	Decrease	Increase
(E)	No change	No change

25. If the demand for a good or service decreases, the equilibrium price and quantity are most likely to change in which of the following ways?

	Price	Quantity
(A)	Increase	Increase
(B)	Increase	Decrease
(C)	Decrease	Decrease
(D)	Decrease	Increase
(E)	No change	No change

26. A decrease in the price of silicon chips and increased production of user-friendly software will affect the price and quantity of computers in which of the following ways?

	Price	Quantity
(A)	Increase	Increase
(B)	Increase	Decrease
(C)	Decrease	Decrease
(D)	Decrease	May increase, decrease or remain the same
(E)	May increase, decrease or remain the same	Increase

27. An improvement in the technology used in the production of automobiles and an increase in the need for automobile transportation will most likely cause the price and quantity of automobiles to change in which of the following ways?

	Price	Quantity
(A)	Increase	Increase
(B)	Increase	Decrease
(C)	May increase, decrease, or stay the same	Increase
(D)	Decrease	May increase, decrease or remain the same
(E)	Decrease	Increase

28. An increase in the price of peanut butter will cause the demand curve for jelly to shift in which of the following directions?
    (A) To the right, because peanut butter is a product that the government says is good for you
    (B) To the right, if jelly is purchased by people with lower incomes and peanut butter is a luxury good for them
    (C) To the right, if peanut butter and jelly are complementary goods
    (D) To the left, if peanut butter and jelly are complementary goods
    (E) To the left, if peanut butter and jelly are substitute goods

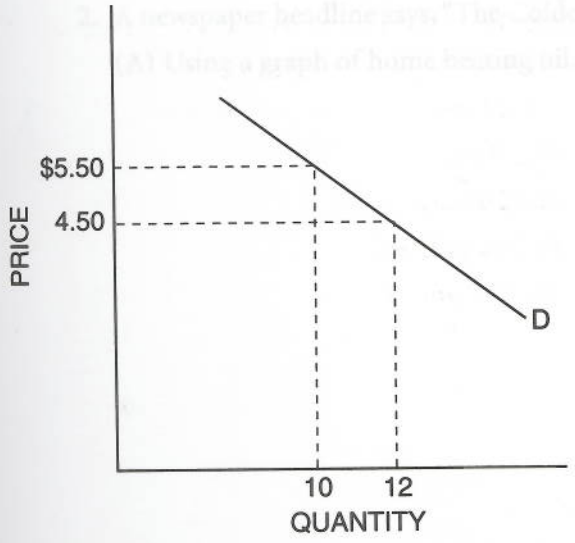
29. According to the theory of comparative advantage, a good should be produced at the point where
    (A) its explicit costs are least.
    (B) its opportunity costs are least.
    (C) the cost of real resources used is least.
    (D) production can occur with the greatest increase in employment.
    (E) production can occur with the lowest increase in employment.

30. An increase in the price of gasoline will *most likely* cause the demand curve for tires to change in which direction?
    (A) To the left, because gasoline and tires are substitutes
    (B) To the left, because gasoline and tires are complements
    (C) To the right, because gasoline and tires are substitutes
    (D) To the right, because gasoline and tires are complements
    (E) To the right, because an increase in the price of gasoline makes consumers poorer and thus not willing to pay as much for tires

31. All of the following might reasonably be expected to shift the demand curve for beef to a new position *except*
    (A) a decrease in the price of beef.
    (B) a change in people's tastes with respect to beef.
    (C) an increase in the money incomes of beef consumers.
    (D) a widespread advertising campaign by the producers of a product competitive with beef, such as pork.
    (E) expectations that beef prices will fall in the future.

32. Specialization and trade will not take place in which of the following cases?
    I. The opportunity costs of making two goods are the same in both countries.
    II. Wartime emergencies completely cut off trade routes.
    III. Tariff barriers increase the delivered cost of ordinary imported goods.
    (A) I only
    (B) II only
    (C) III only
    (D) I and II only
    (E) I, II and III

33. The Hatfields and McCoys have been fumin', fussin' and 'a fightin' for years. In the Hatfield family, a unit of cloth is worth 0.8 units of corn. At the McCoy's, a unit of cloth is worth 1.25 units of corn. The Hatfields, however, produce more corn and cloth than the McCoys because they have higher quality resources. Despite the feud, is there a basis for specialization and trade?
    (A) No, the McCoys bring no net value to the community of Hatfield and McCoy.
    (B) No, the opportunity costs are the same for the Hatfields and the McCoys.
    (C) Yes, the Hatfields enjoy both a comparative and absolute advantage in cloth.
    (D) Yes, the Hatfields enjoy both a comparative and absolute advantage in corn.
    (E) Yes, the Hatfields enjoy both a comparative and absolute advantage in both corn and cloth.



34. Between a price of $5.50 and $4.50, the demand curve in the figure above can be described as
    (A) perfectly elastic.
    (B) relatively elastic.
    (C) unit elastic.
    (D) relatively inelastic.
    (E) perfectly inelastic.

35. With a relatively elastic demand curve, if price increases by 10 percent, the quantity will most likely
    (A) increase by less than 10 percent.
    (B) increase by more than 10 percent.
    (C) decrease by less than 10 percent.
    (D) decrease by exactly 10 percent.
    (E) decrease by more than 10 percent.

36. "If you want to have anything done correctly, you have to do it yourself." This quote violates the principle of which of the following economic concepts?
    (A) Scarcity
    (B) Supply
    (C) Comparative advantage
    (D) Diminishing returns
    (E) Demand

Sample Short Free-Response Questions

1. True, false or uncertain, and explain why? "The economic concept of scarcity is not relevant to the study of a modern economy such as that of the United States because the existence of unsold stocks of goods (books, cars, homes) is vivid evidence that we are surrounded by plenty, not scarcity."

2. A newspaper headline says, "The Coldest Winter in 20 Years Brings Record Prices for Heating Oil."
   (A) Using a graph of home heating oil, show and explain how price changed.

   (B) What other factors could cause the price of heating oil to increase?

3. In a recent year, the price of wheat fell. For each of the following, draw a supply and demand graph showing a decrease in prices with the stated impact on quantity.

(A) The quantity of wheat decreasing

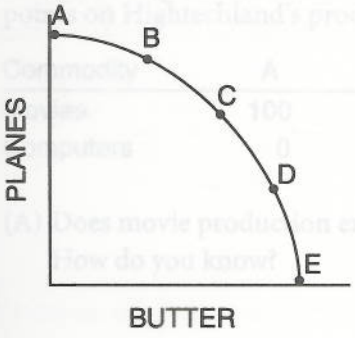
(B) The quantity of wheat increasing

(C) The quantity of wheat staying the same

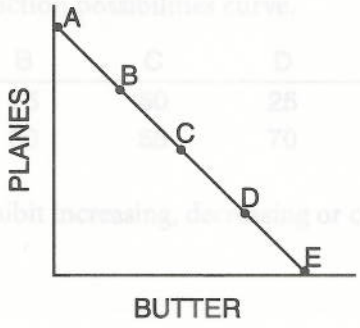
4. True, false or uncertain, and explain why? "If you won $1 million in the lottery, you wouldn't have the economic problem of scarcity."

5. Explain what would have to be true in each case for the production possibilities curves to be shaped as they are in Graphs I, II and III.

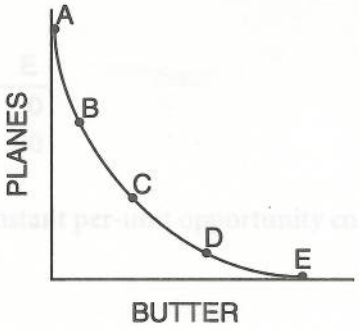
Graph I



Graph II



Graph III



Sample Long Free-Response Questions

1. Every society has the fundamental problem of scarcity.

   (A) What is scarcity?

   (B) What three questions must every society answer because of scarcity?

   (C) What are the three ways societies have dealt with the scarcity problem?

   (D) Give one example of how each way is used in the United States.

2. Hightechland produces two commodities: movies and computers. Hightechland's resources include workers, factories, electricity and so on. The following schedule indicates some of the points on Hightechland's production possibilities curve.

Commodity	A	B	C	D	E
Movies	100	75	50	25	0
Computers	0	30	55	70	80

   (A) Does movie production exhibit increasing, decreasing or constant per-unit opportunity costs? How do you know?

   (B) Graph Hightechland's production possibilities curve, and label it AA.

(C) Suppose Hightechland is operating at Point C but would like to alter production to Point D. What would be the per-unit opportunity cost of producing more computers?

(D) Suppose Hightechland is operating at Point C but would like to alter production to Point B. What would be the per-unit opportunity cost of producing more movies?

(E) What will happen to Hightechland's production possibilities curve if many of its movie sets are destroyed by fire? (Assume that the sets are not used in the production of computers.) Using the same graph you drew for Question 2(B), draw Hightechland's new production possibilities curve and label it BB.

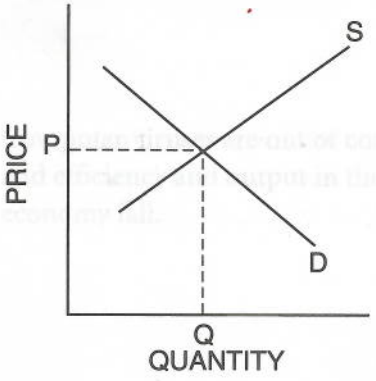
(F) What will happen to Hightechland's production possibilities curve if all the country's resources are reduced (perhaps by natural disaster or war)? Using the same graph as in Question 2(B), draw Hightechland's new production possibilities curve and label it CC.

(G) What will happen to Hightechland's production possibilities curve if technology improves both the production of movies and the production of computers? Using the same graph as in Question 2(B), draw Hightechland's new production possibilities curve and label it DD.

3. The market for many commodities is seasonal in nature. Their sales (equilibrium quantity) increase dramatically during certain times of the year. Christmas cards and fresh strawberries, at least in the North, are two examples. Christmas card sales increase during the last three months of the year, and the sales of fresh strawberries in the North increase during the summer months. But the (equilibrium) price movement of these two commodities is quite different during their peak sales season: Christmas cards increase in price during the last three months of the year, whereas strawberries decrease in price during the summer.

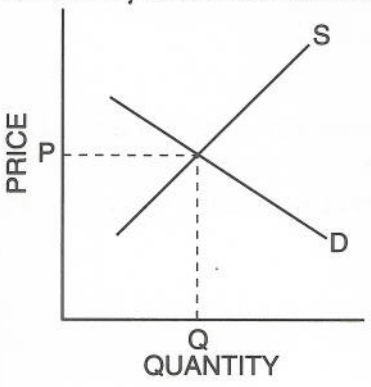
   (A) Show on the graph below how there can be an increase in the equilibrium quantity and an increase in the equilibrium price of Christmas cards during the last three months of the year, and briefly explain what has happened.

Christmas Card Market



   (B) Change the graph for fresh strawberries in the North to show how there can be an increase in the equilibrium quantity and a decrease in the equilibrium price of strawberries in the summer, and briefly explain what has happened.

Strawberry Market in the North



4. Explain how each of the following may affect the production possibilities curve of the United States or the point at which the economy is operating. Draw a production possibilities curve; put "Capital Goods" on the vertical axis and "Consumer Goods" on the horizontal axis. Now, add a PPC curve or point to the graph to illustrate the scenario.

   (A) The Congress and the president decide to provide more funding for higher education with more students attending college and graduating.

   (B) New advances in medicine allow for a healthier lifestyle.

   (C) The United States agrees to be a part of a world-trade agreement that will foster international trade.

(D) The unemployment rate increases in the economy from 4.2 percent to 5.1 percent of the labor force.

(E) Computer viruses are out of control, and efficiency and output in the economy fall.

Macroeconomics | Unit 2

Measuring Economic Performance

- Macroeconomics is the study of the economy as a whole; microeconomics is the study of individual parts of the economy such as businesses, households and prices. Macroeconomics looks at the forest; microeconomics looks at the trees.
- A circular flow diagram illustrates the major flows of goods and services, resources and income in an economy. It shows how changes in these flows can alter the level of goods and services, employment and income.
- Gross domestic product (GDP) is the market value of all final goods and services produced in a nation in one year. It is the most important measurement of production and output.
- GDP counts only final goods and services; it does not count intermediate goods and services.
- GDP also does not count secondhand goods; the buying and selling of stocks and bonds; and transfer payments such as Social Security benefits, unemployment compensation and certain interest payments.
- GDP includes profits earned by foreign-owned businesses and income earned by foreigners in the United States, but it excludes profits earned by U.S.-owned companies overseas and income earned by U.S. citizens who work abroad.
- GDP may be calculated in two ways:
  1. Add all the consumption, investment and government expenditures plus net exports or
  2. Add all the incomes received by owners of productive resources in the economy.
- Price indexes measure price changes in the economy. They are used to compare the prices of a given bundle or market basket of goods and services in one year with the prices of the same bundle or market basket in another year.
- A price index has a base year, and the price level in that year is given an index number of 100. The price level in all other years is expressed in relation to the price level in the base year.

$$\text{Price index number} = \frac{\text{weighted cost of base-period items in current-year prices}}{\text{weighted cost of base-period items in base-year prices}} \times 100$$

- The most frequently used price indexes are the GDP price deflator, the consumer price index (CPI) and the producer price index (PPI).
- Real GDP is adjusted for price changes; nominal GDP is not adjusted for price changes.
- Inflation is a general increase in the overall price level.
- Savers, lenders and people on fixed incomes generally are hurt by unanticipated inflation; borrowers gain from unanticipated inflation.
- Unemployment occurs when people who are willing and able to work cannot find jobs at satisfactory wage rates.
- Unemployment is classified into three categories: frictional, cyclical and structural.
- The unemployment rate represents people who are not working but who are actively looking for a job.
- Full employment is not defined as zero unemployment because frictional and structural unemployment exist even with zero cyclical unemployment.

- The unemployment rate at full employment is called the natural rate of unemployment.
- The labor force is defined as people who have a job (employed) and people who are actively looking for a job (unemployed). The labor force participation rate is the percentage of the population over the age of 16 that is in the labor force.
- A business cycle describes the ups and downs of economic activity over a period of years.
- The phases of the business cycle are expansion (recovery), peak, contraction (recession) and trough.

Test of Macroeconomic Thinking

Circle T for true or F for false in the statements that follow.

T F 1. If a country could maintain a high economic growth rate, the country would eventually be able to satisfy everyone's wants for goods and services.

T F 2. If all the nations of the world disarmed, the international economy would collapse into a long depression and unemployment would increase.

T F 3. Money is an important economic resource.

T F 4. The higher the GDP, the better off all the people of the country are.

T F 5. Full employment means zero unemployment.

T F 6. The United States has had an inflation rate of at least 3 percent for each of the last 50 years.

T F 7. Unanticipated inflation hurts almost everyone.

T F 8. Money consists mainly of currency and coins and is created by government printing presses and mints.

T F 9. The value of the dollar is determined by the fact that it is backed by gold.

T F 10. Most economists believe the only purpose of taxes is to provide money for government.

T F 11. The chief task of the Federal Reserve System is to insure the deposits of bank customers.

T F 12. Tariffs are needed to protect our standard of living from competition from cheap foreign labor.

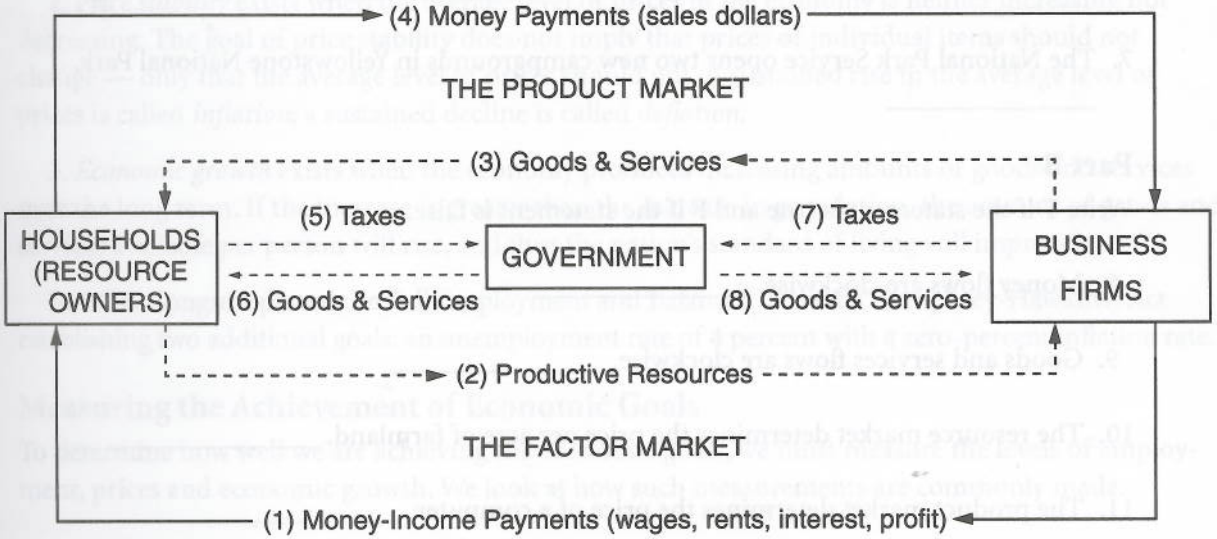
Activity written by John Morton, National Council on Economic Education, New York, N.Y.

Understanding the Circular Flow of the Macroeconomy

Firms provide goods and services to households through the product markets. Households pay for these goods and services with money. Households supply firms with productive resources: labor, land, capital and entrepreneurial skills. Firms pay money income to households. The value of income firms pay to households, including the profits that business owners receive, equals the dollar value of output. Firms and households decide how much to buy or sell in the markets for goods and resources. For example, Tran spends $10.00 on school supplies at the market, buying goods and paying with money. The market owner uses the $10.00 to pay part of the salary of Mariko, the cashier. The firm is buying resources and paying for them with money. The $10.00 is now ready to be spent in another round. Firms and households pay taxes and user fees to the government, which provides them with some goods and services, such as police protection and national defense.

Figure 10.1

The Circular Flow of Resources, Goods, Services and Money Payments



Activity written by Helen Roberts, University of Illinois, Chicago, Ill.

Part A

Each of the flows in the circular flow diagram in Figure 10.1 is numbered. Identify which number matches the transaction described in the statements below. Consider only the first transaction — not the return flow.

1. David buys a CD at the local store for $9.99. _____
2. Emily earns $6.50 per hour entering data at the music conservatory. _____
3. Maria pays her federal income tax. _____
4. Jagdish receives $15,000 in profits from his half-ownership of a coffee shop. _____
5. Keisha makes decorative pillows that she sells for $30.00. _____
6. Mammoth Toys Inc. hires 100 new employees. _____
7. The National Park Service opens two new campgrounds in Yellowstone National Park. _____

Part B

Write T if the statement is true and F if the statement is false.

8. Money flows are clockwise. _____
9. Goods and services flows are clockwise. _____
10. The resource market determines the price per acre of farmland. _____
11. The product market determines the price of a computer. _____
12. Firms sell resources in the resource markets. _____
13. Government buys resources and households sell resources. _____
14. Government buys products, and firms sell products. _____
15. The product market determines the salary of the C.E.O. of a firm. _____
16. The resource market determines the price of soda. _____
17. The resource market determines the price of soda-bottling equipment. _____