

Economics: Foundations and Models

Chapter Summary

People must make choices as they try to attain their goals. These choices usually mean that people must accept trade-offs among various competing objectives due to society's limited resources. **Economics** is the study of the choices people make to attain their goods, given their scarce resources. Economists assume that people are rational, respond to economic incentives, and make decisions at the margin. Economists construct **models**, simplified versions of some aspect of economic life, to analyze economic issues such as how buyers and sellers make decisions.

Every society faces the economic problem of limited resources. Therefore, society can produce only limited quantities of goods and services. Societies face trade-offs and must consider the opportunity costs of decisions, particularly when answering the three fundamental questions any economy must answer:

1. *What* goods and services will be produced?
2. *How* will the goods and services be produced?
3. *Who* will receive the goods and services?

Societies organize their economies in two main ways to answer these questions. A society can have a **centrally planned economy** characterized by extensive government decision making. Or, a society can have a market economy where resource allocation is determined by the decisions of households and firms interacting in markets. All high-income democracies have market economies or mixed economies. A **mixed economy** is a market-based economy with some government intervention. Market economies tend to allocate resources more efficiently than do centrally planned economies, but efficient outcomes may not be perceived as fair. Determining what is a fair or equitable outcome calls for the application of **normative analysis** – *what ought to be*. **Positive analysis** is concerned with *what is*. While most or all economists can agree on the results of positive economic analysis, their opinions often differ on *what ought to be*.

Microeconomics is the study of how individual choices are made by households, firms, and the government. **Macroeconomics** is the study of the economy as a whole.

The Appendix to Chapter 1 provides a review of basic mathematical tools and techniques that will be applied through the textbook.

Learning Objectives

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

1. **Discuss these three important ideas: People are rational. People respond to incentives. Optimal decisions are made at the margin.** Economists use these ideas to analyze the way people make decisions. These ideas are especially important in analyzing what happens in markets, which is the primary focus of economic analysis.
2. **Discuss how an economy answers these questions: *What goods and services will be produced? How will the goods and services be produced? Who will receive the goods and services?*** Every society must answer these questions because the resources available to produce goods and services are scarce. Even nations with abundant supplies of natural resources cannot produce enough goods and services to satisfy the desires of all their citizens. Therefore, societies face trade-offs. Producing more of one good or service means producing less of another good or service.
3. **Understand the role of models in economic analysis.** Economic models are created by applying the scientific method to economic data. These models are simplified versions of reality used to analyze real-world issues. Economic models are used to explain issues such as whether or not outsourcing has been good or bad for the U.S. economy. This is a complex question that requires more than one model to explain different aspects of the issue.
4. **Distinguish between microeconomics and macroeconomics.** Economic decision-making is grouped into two areas. Microeconomics is the study of how households and firms make choices, interact in markets, and how the government attempts to influence their choices. Macroeconomics studies the economy as a whole, including topics such as inflation, unemployment, and economic growth.
5. **Become familiar with important economic terms.** This chapter includes descriptions and definitions of important terms that will be used in other chapters of the textbook.

Appendix: Review the use of graphs and formulas. Graphs simplify economic ideas and make the ideas concrete so they can be applied to real-world problems. Whether or not your instructor assigns the appendix, it is a good idea to read it because it will help you understand how to read and interpret the many graphs that appear throughout the book.

Chapter Review

Chapter Opener: What Happens When U.S. Firms Move to China? (pages 2-3)

In 2004, executives of 3Com Corporation decided to build a new network switch for corporate security systems in China. Part of the rationale for these executives was to save money: Chinese engineers receive lower salaries than engineers in the United States. 3Com is one of many U.S. firms that have established manufacturing, service, and design operations in other countries. This practice is often called *outsourcing*. An understanding of economics will help you to understand outsourcing and many other important issues that you hear in the news and in classes.

The textbook describes how economics is used to answer many important questions, including whether or not a firm should outsource. All of these questions represent a basic economic fact of life: people must make choices as they try to attain their goals. These choices occur because of scarcity, which is the most

fundamental economic concept. The resources available to any society – for example, land, and labor – to produce the goods and services its citizens want are limited. Society has to choose which goods and services will be produced and who will receive them.

 Helpful Study Hint

At the beginning of each chapter in this textbook is a chapter opener that describes an economic issue facing one or more real-world companies. You will find other special features throughout the book. For instance *An Inside Look* appears at the end of each chapter. This feature analyzes a topic related to the chapter opener using a magazine or newspaper article. Questions are included at the end of each article to test your knowledge of the topic. In this chapter, *An Inside Look* discusses whether the United States should be concerned about competition from high-tech firms in China and India. The article argues that fear of competition from China and India is exaggerated because the United States has many advantages that should allow it retain many high-skilled, high wage jobs.

The *Economics in YOUR Life!* feature asks whether it is likely that you will experience a job loss due to outsourcing. Think about this question as you read the chapter. The authors will answer this question at the end of the chapter.

1.1 LEARNING OBJECTIVE

1.1 Three Key Economic Ideas (pages 4-7)

Learning Objective 1 Discuss these three important ideas: People are rational. People respond to incentives. Optimal decisions are made at the margin.

Economics examines how people interact in markets. A **market** refers to a group of buyers and sellers of a good or service and the institution or arrangement by which they come together to trade. Economists make three important assumptions about the way people interact in markets. First, people are rational. This means that buyers and sellers use all available information to achieve their goals. Second, people act in response to economic incentives. Third, optimal decisions are made at the margin. The terms “marginal benefit” and “marginal cost” refer to the additional benefits and costs of a decision. Economists reason that the best, or optimal, decision is to continue any activity up to the point where the marginal benefit (or *MB*) equals the marginal cost (*MC*). In symbols, we can write $MB = MC$.

 Helpful Study Hint

The image many people have of a market is a supermarket, neighborhood store, or shopping mall. But some markets do not have an easily identifiable image. Many people make online purchases with their computers. In these markets, buyers and sellers do not see each other and may be located hundreds of miles from one another. For some goods (for example, books and CDs), is it not necessary for buyers to see or test merchandise before they buy it. For other goods (clothing, food, automobiles), some personal contact is important. In many of these cases, sellers have a physical location to which buyers must travel to try out the product. There are also markets in

which sellers travel to their buyers. Pharmaceutical salespersons who visit doctors' offices are one well-known example.

In the movie *Wall Street*, Gordon Gekko, a ruthless businessman played by Michael Douglas, proclaims “Greed is good.” You should not assume that the phrase “people respond to economic incentives” means that people are greedy. The phrase “people respond to economic incentives” is an objective statement or a statement shown to be true rather than a belief or opinion. In contrast, Gordon Gekko’s statement was subjective; he stated his opinion that “greed is good.” Economists do not believe people are motivated solely by monetary incentives. Many people voluntarily devote their time and financial resources to friends, family members and charities.

See the *Making the Connection* “Will Women Have More Babies if the Government Pays Them To?” for a discussion of how economic incentives may alter people’s behavior. Some countries have been experiencing a decline in birth rates, which will mean a decrease in population growth and future tax revenues. In some countries, the birth rate has fallen below the replacement level, which means that the population will actually begin shrinking. Some countries have begun to provide incentives to encourage women to have babies. There is evidence that this is working in Estonia, but it may be too early into the program to know if it will be successful.

The first *Solved Problem* is at the end of this section of the textbook. Each *Solved Problem* helps you understand one of the chapter’s learning objectives. The authors use a step-by-step process to show how you can solve the problem. Additional Solved Problems, different from those that appear in the textbook, are included in each chapter of this Study Guide. *Solved Problem 1-1* in the textbook is an example of how Apple can use marginal analysis to decide whether to increase output. To make this decision, Apple must compare the additional benefit – the margin benefit – generated by producing the extra output to the additional cost – marginal cost – from the production of that output. If the additional (or marginal) benefit is greater than the marginal cost, then Apple should produce more iPods.

1.2 LEARNING OBJECTIVE

1.2 The Economic Problem That Every Society Must Solve (pages 8-11)

Learning Objective 2 Discuss how an economy answers these questions: *What* goods and services will be produced? *How* will the goods and services be produced? *Who* will receive the goods and services?

The basic economic problem any society faces is that it has only a limited amount of economic resources and so can produce only a limited amount of goods and services. Societies face **trade-offs** when answering the three fundamental economic questions:

1. *What* goods and services will be produced?
2. *How* will the goods and services be produced?
3. *Who* will receive the goods and services?

Societies organize their economies in two main ways. A **centrally planned economy** is an economy in which the government decides how economic resources will be allocated. From 1917 to 1991, the Soviet Union was the most important centrally planned economy. Today Cuba and North Korea are among the few remaining centrally planned economies. A **market economy** is an economy in which the decisions of households and firms interacting in markets allocate economic resources. The United States, Canada, Western Europe, and Japan all have market economies. Privately owned firms must produce and sell goods and services consumers want to stay in business. An individual's income is determined by the payments he receives for what he has to sell.

 **Helpful Study Hint**

In a planned economy, government officials or “planners” are responsible for determining how much of each good to produce, who should produce it, and where it should be produced. In contrast, in a market economy no government official determines how much corn, wheat, or potatoes should be produced. Individual producers and consumers interact in markets for these goods to determine the answers to *What? How? and Who?* The role of government in a market economy is similar to that of an umpire in a baseball game. Government officials can pass and enforce laws that allow people to act in certain ways but do not participate directly in markets as consumers or producers.

The high rates of unemployment and business bankruptcies of the Great Depression caused a dramatic increase in government intervention in the economy in the United States and other market economies. Some government intervention is designed to raise the incomes of the elderly, the sick, and people with limited skills. In recent years, government intervention has expanded to meet social goals such as protection of the environment and the promotion of civil rights. The expanded role of government in market economies has led most economists to argue that the United States and other nations have **mixed economies** rather than market economies.

Market economies tend to be more efficient than planned economies because market economies promote competition and voluntary exchange. There are two types of efficiency. **Productive efficiency** occurs when a good or service is produced at the lowest possible cost. **Allocative efficiency** is a state of the economy in which production represents consumer preferences. Specifically, every good or service is produced up to the point where the marginal benefit that the last unit produced provides to consumers is equal to the marginal cost of producing it. Inefficiencies do occur in markets for three main reasons. First, it may take time for firms to achieve productive efficiency. Second, governments may reduce efficiency by interfering with voluntary exchanges in markets. Third, production of some goods may harm the environment when firms ignore the costs of environmental damage.

Society may not find efficient economic outcomes to be the most desirable outcomes. Many people prefer economic outcomes they consider fair or equitable even if these outcomes are less efficient. Equity is the fair distribution of economic benefits.

 Helpful Study Hint

There are many examples of government regulation on private markets in the United States. The sale and use of cocaine and other drugs is illegal, and the sale of cigarettes is allowed only to people 18 years and older. Between 1920 and 1933, the production and sale of alcoholic beverages was also illegal in the United States.

Extra Solved Problem 1-2

Chapter 1 includes a Solved Problem. Here is an extra Solved Problem to help you build your skills solving economic problems.

Supports Learning Objective 2: Discuss how an economy answers these questions: *What goods and services will be produced? How will the goods and services be produced? Who will receive the goods and services?*

Giving Advice to New Government Leaders

Suppose that a developing nation is experiencing a change in government leadership. Prior to this change the nation had a centrally planned economy. The new leaders are willing to try a different system if they can be convinced that it will yield better results. They hire an economist from a nation with a market economy to advise them and will order their citizens to follow this advisor's recommendations for change. The economist suggests that a market economy replace central planning to answer the nation's economic questions (*what, how and who?*).

- a. What will the economist suggest the leaders order their citizens to do?
- b. Do you believe the leaders and citizens will accept the economist's suggestions?

SOLVING THE PROBLEM

Step 1: Review the chapter material.

The problem concerns the choice of economic system a nation must make, so you may want to review the section "Centrally Planned Economies versus Market Economies," which begins on page 9 in the textbook.

Step 2: What will the economist suggest the leaders order their citizens to do?

Market economies allow members of households to follow their self-interest in selecting which occupation to enter and which goods and services to purchase. Market economies also allow privately owned firms to follow their self-interest in selecting which goods and services to produce. Therefore, the economist would ask the leaders of the poor country to not issue any orders. Government officials should ordinarily not attempt to influence individual decisions made in markets.

Step 3: Do you believe the leaders and citizens will accept the economist's suggestions?

Even democratically elected rulers, especially those with previous experience with significant government involvement in the nation's resource allocation, will find it difficult to accept the

new system. They may wonder how self-interested individuals will produce and distribute goods and services so as to promote the welfare of the entire nation. This new system requires a significant reduction in the government's power to influence people's lives. History has shown that government officials are often reluctant to give up this power. Acceptance is most likely to occur when the rulers have some knowledge of the successful operation of a market economy in other countries. Most ordinary citizens are more likely to accept the economist's suggestions because they will have more freedom to pursue their own economic goals. However, those who benefited from the previous system will resist change.

1.3 LEARNING OBJECTIVE

1.3 Economic Models (pages 11-15)

Learning Objective 3 Understand the role of models in economic analysis.

Models are simplified versions of reality used to analyze real-world situations. To develop a model, economists generally follow five steps.

1. Decide on the assumptions to be used in developing the model.
2. Formulate a testable hypothesis.
3. Use economic data to test the hypothesis.
4. Revise the model if it fails to explain well the economic data.
5. Retain the revised model to help answer similar economic questions in the future.

Models rely on assumptions because models must be simplified to be useful. For example, models make behavioral assumptions about the motives of consumers and firms. Economists assume that consumers will buy the goods and services that will maximize their satisfaction and that firms will produce the goods and services that will maximize their profits.

An **economic variable** is something measurable that can have different values, such as the wages of software programmers. A *hypothesis* is a statement that may be correct or incorrect about an economic variable. An economic hypothesis usually states a causal relationship where a change in one variable causes a change in another variable. For example, “outsourcing leads to lower wages for software programmers” means that an increase in the amount of outsourcing will reduce the wages of software programmers. **Positive analysis** is analysis concerned with what is and involves questions that can be estimated. **Normative analysis** is analysis concerned with what ought to be and involves questions of values and basic assumptions.



Helpful Study Hint

For a good explanation of what a model is and how models are used in economics, read the first section of the Appendix to Chapter 1.

A feature introduced in Chapter 1 of the text – ***Making the Connection*** – describes a debate between two prominent economists over outsourcing. ***Making the Connection*** features in other chapters relate concepts described in the text to recent business stories.

Positive economic analysis deals with statements that can be proved correct or incorrect by examining facts. If your instructor stated that “It is snowing outside,” it would be easy to determine whether this statement is true or false by looking out a window. Normative analysis

concerns statements of belief or opinion. If your instructor wants to go skiing that evening and states that “It *should* be snowing outside today,” you could not prove the statement wrong because it is a statement of *opinion*. It is important to recognize the difference between these two types of statements. The feature ***Don’t Let This Happen to You!*** appears in each chapter to alert you to mistakes often made by economics students. To reinforce the difference between positive and normative statements, review ***Don’t Let This Happen To YOU!*** “Don’t Confuse Positive Analysis with Normative Analysis,” where the minimum wage law is discussed. Positive analysis can show us the effects of the minimum wage law on the economy, but it cannot tell us whether the policy is good or bad. Nor can positive analysis tell us whether we should increase or decrease the minimum wage. The discussion of whether a policy is good or bad will depend on an individual’s values and experiences and falls under the realm of normative analysis.

1.4 LEARNING OBJECTIVE

1.4 Microeconomics and Macroeconomics (page 15)

Learning Objective 4 Distinguish between microeconomics and macroeconomics.

Microeconomics is the study of how households and firms make choices, how they interact in markets, and how the government attempts to influence their choices. **Macroeconomics** is the study of the economy as a whole, including topics such as inflation, unemployment, and economic growth.

1.5 LEARNING OBJECTIVE

1.5 A Preview of Important Economic Terms (pages 15-16)

Learning Objective 5 Become familiar with important economic terms.

This chapter introduces twelve economic terms that will each be covered in depth in future chapters. Those terms are: entrepreneur, innovation, technology, firm, goods, services, revenue, profit, household, factors of production, capital, and human capital.

Helpful Study Hint

At the beginning of the chapter, you read the ***Economics in YOUR Life!*** question: “Are You Likely to Lose Your Job to Outsourcing?” The authors answer the question at the end of the chapter. Jobs are continuously created and eliminated in the U.S. economy. Only a small percentage of jobs are outsourced, so, even though you are likely to lose your job once or twice during your career, it will probably *not* be due to outsourcing.

Appendix

Using Graphs and Formulas (pages 24-35)

LEARNING OBJECTIVE: Review the use of graphs and formulas.

Graphs of One Variable

Bar charts, pie charts and time-series graphs are alternative ways to display data visually. Figures 1A-1 and 1A-2 illustrate how relationships are often easier to understand with graphs than with words or tables alone.

Graphs of Two Variables

Both microeconomics and macroeconomics use two-variable graphs extensively. You need to understand how to measure the slope of a straight line drawn in a graph. The slope of a straight line can be measured between any two points on a line because the slope of a straight line has a constant value, so we don't need to worry about the value of the slope changing as we move up and down the line. Slope can be measured as the change in the value measured on the vertical axis divided by the change in the value measured on the horizontal axis. In symbols, the slope formula is written as $\Delta y/\Delta x$. The formula is also described as "rise over run." The usual custom is to place the variable y on the graph's vertical axis and the variable x the horizontal axis. If the slope is negative, then the two variables are inversely related. If the slope is positive, then the two variables are positively related. We can show the effect of more than two variables in a graph by shifting the line representing the relationship between the first two variables. For example, we can draw a graph showing the effect of a change in the price of pizza on the quantity of pizza demand during a given week. We can then shift this line to show the effect of an change in the price of hamburgers on the quantity of pizza demanded.

Formulas

The formula for a percentage change of a variable over time (or growth rate) is:

$$\frac{Value_2 - Value_1}{Value_1} \times 100\%$$

The formula for the area of a rectangle is Base x Height. The formula for the area of a triangle is $\frac{1}{2}$ x Base x Height.

Key Terms

Allocative efficiency. A state of the economy in which production is in accordance with consumer preferences; in particular, every good or service is produced up to the point where the last unit provides a marginal benefit to society equal to the marginal cost of producing it.

Centrally planned economy. An economy in which the government decides how economic resources will be allocated.

Economic model. A simplified version of reality used to analyze real-world economic situations.

Economic variable. Something measurable that can have different values, such as the wages of software programmers.

Economics. The study of the choices people make to attain their goals, given their scarce resources.

Equity. The fair distribution of economic benefits.

Macroeconomics. The study of the economy as a whole, including topics such as inflation, unemployment, and economic growth.

Marginal analysis. Analysis that involves comparing marginal benefits and marginal costs.

Market. A group of buyers and sellers of a good or service and the institution or arrangement by which they come together to trade.

Market economy. An economy in which the decisions of households and firms interacting in markets allocate economic resources.

Microeconomics. The study of how households and firms make choices, how they interact in markets, and how the government attempts to influence their choices.

Mixed economy. An economy in which most economic decisions result from the interaction of buyers and sellers in markets but in which the government plays a significant role in the allocation of resources.

Opportunity cost. The highest-valued alternative that must be given up to engage in an activity.

Normative analysis. Analysis concerned with what ought to be.

Positive analysis. Analysis concerned with what is.

Productive efficiency. The situation in which a good or service is produced at the lowest possible cost.

Scarcity. The situation in which unlimited wants exceed the limited resources available to fulfill those wants.

Trade-off. The idea that because of scarcity, producing more of one good or service means producing less of another good or service.

Voluntary exchange. The situation that occurs when both the buyer and the seller of a product are made better off by the transaction.

Self-Test

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

Multiple-Choice Questions

1. Which of the following questions could be answered using economics?
 - a. “How are the prices of goods and services determined?”
 - b. “How does pollution affect the economy, and how should government policy deal with these effects?”
 - c. “Why do firms engage in international trade, and how do government policies affect international trade?”
 - d. All of the above are economic questions.

2. Which of the following statements best describes scarcity?
 - a. Scarcity studies the choices people make to attain their goals.
 - b. Scarcity is a situation where unlimited wants exceed limited resources.
 - c. Scarcity is an imbalance between buyers and sellers in a specific market.
 - d. Scarcity refers to a lack of tradeoffs.

3. When you think of an arrangement or institution that brings buyers and sellers of a good or service together, what are you thinking of?
 - a. Marginal analysis
 - b. A market
 - c. Scarcity
 - d. Rational behavior

4. Fill in the blanks. In economics, as well as in life, optimal decisions are made _____.
 - a. once all costs have been considered
 - b. only when all benefits have been considered
 - c. in their totality
 - d. at the margin

5. In Solved Problem 1-1: “Should Apple produce an additional 300,000 iPods?” which of the concepts below is most applicable in solving the problem?
 - a. The concept of what a market is
 - b. Rational behavior and how people respond to economic incentives
 - c. Marginal analysis
 - d. The concept of scarcity and tradeoffs

6. Which of the following is not among the fundamental economic questions that every society must solve?
 - a. What goods and services will be produced?
 - b. How will the goods and services be produced?
 - c. What goods and services will be exchanged?
 - d. Who will receive the goods and services produced?

7. What types of economies require that we answer the questions of what, how, and for whom to produce goods and services?
 - a. Market economies
 - b. Centrally planned economies
 - c. Mixed economies
 - d. All of the above
8. In what type of economy does the government decide how economic resources will be allocated?
 - a. In a market economy
 - b. In a mixed economy
 - c. In a centrally planned economy
 - d. In none of the above
9. Which of the following is the best classification for the economies of the United States, Canada, Japan, and Western Europe?
 - a. Market economies
 - b. Mixed economies
 - c. Centrally planned economies
 - d. None of the above
10. Which of the following terms best relates to a fair distribution of economic benefits?
 - a. Productive efficiency
 - b. Allocative efficiency
 - c. Voluntary exchange
 - d. Equity
11. Which of the following is achieved when a good or service is produced up to the point where the marginal benefit to consumers is equal to the marginal cost of producing it?
 - a. Productive efficiency
 - b. Allocative efficiency
 - c. Equality
 - d. Equity
12. Which of the following terms summarizes the situation in which a buyer and a seller exchange a product in a market and, as a result, both are made better off by the transaction?
 - a. Productive efficiency
 - b. Allocative efficiency
 - c. Voluntary exchange
 - d. Equity
13. What does an economy achieve by producing a good or service at the least possible cost?
 - a. Productive efficiency
 - b. Allocative efficiency
 - c. Voluntary exchange
 - d. Equity

14. Which of the following best describes the characteristics of models used in economics?
 - a. Models are approximations to reality that capture as many details as possible.
 - b. Models are usually complex abstractions of reality that simulate practical problems.
 - c. Models are demonstrations of how economic concepts and theories accurately predict real situations.
 - d. Models are simplifications of reality that include only essential elements and exclude less relevant details.

15. Which of the following is not an essential component of an economic model?
 - a. Assumptions
 - b. Hypotheses
 - c. Variables
 - d. Normative statements

16. What is the purpose of an economic hypothesis?
 - a. To establish a behavioral assumption
 - b. To establish a causal relationship
 - c. To make a statement based on fact
 - d. To determine the validity of statistical analyses used in testing a model

17. What type of economic analysis is concerned with the way things ought to be?
 - a. Positive analysis
 - b. Marginal analysis
 - c. Normative analysis
 - d. Rational behavior

18. What type of statement would “A minimum wage actually reduces employment” be considered?
 - a. A positive statement
 - b. A marginal statement
 - c. A normative statement
 - d. An irrational conclusion

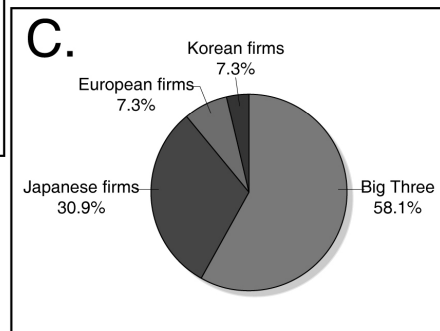
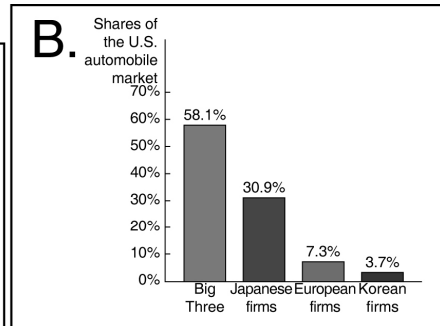
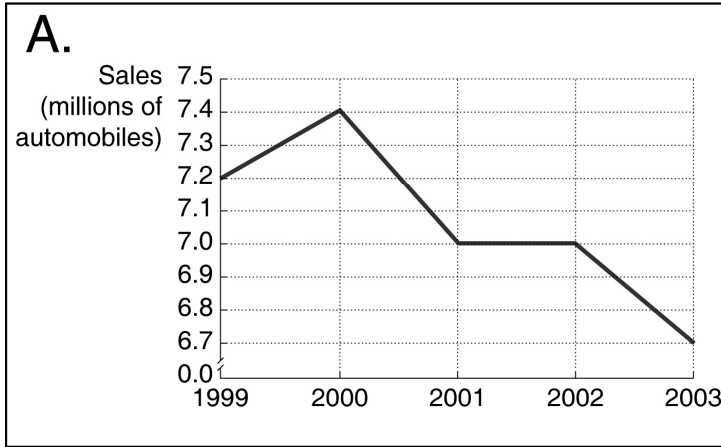
19. Which of the following is an example of a positive question?
 - a. Should the university offer free parking to students?
 - b. Should the university provide more financial aid assistance to students?
 - c. If the college increased tuition, will class sizes decline?
 - d. Should the college cut tuition to stimulate enrollments?

20. Which of the following questions can be answered using normative economic reasoning?
 - a. If the college offers free parking, will more students drive to campus?
 - b. If the college provided more financial aid, would more students go to college?
 - c. If the college hires better qualified instructors, will more students attend?
 - d. Should the college cut tuition in order to stimulate enrollments?

21. Which of the following involves an estimation of the benefits and costs of a particular action?
 - a. Positive economics
 - b. Normative economics
 - c. The market mechanism
 - d. An irrational conclusion

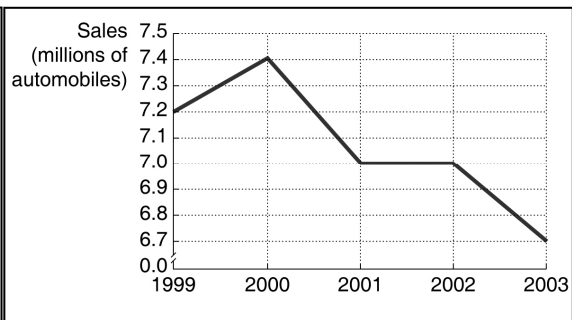
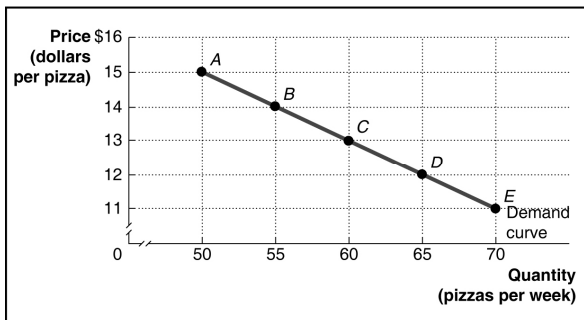
22. What type of assessment is one where a person's values and political views form part of that assessment?
- A positive assessment
 - A normative assessment
 - A microeconomic assessment
 - A macroeconomic assessment
23. Fill in the blank: _____ is the study of how households and businesses make choices.
- Microeconomics
 - Macroeconomics
 - A market mechanism
 - Marginal analysis
24. Which of the following covers the study of topics such as inflation or unemployment?
- Microeconomics
 - Macroeconomics
 - Both microeconomics and macroeconomics give equal emphasis to these problems.
 - None of the above
25. What is the name given to the development of a new good or a new process for making a good?
- An invention
 - An innovation
 - Entrepreneurship
 - Capital
26. What is the name given to the practical application of an invention?
- A model
 - An innovation
 - Voluntary exchange
 - Capital
27. What is the stock of computers, factory buildings, and machine tools used to produce goods better known as?
- Physical capital
 - Technology
 - Innovation
 - Goods and services
28. Human capital is similar to physical capital because
- both represent the value of money as a productive resource.
 - both are financed by the profits of firms.
 - both are productive resources.
 - both represent changes in technology.

29. Which of the following graphs shown below is the graph of a single variable?



- a. A
- b. B
- c. C
- d. All of the above.

30. Which of the following is a graph of the relationship between two variables?

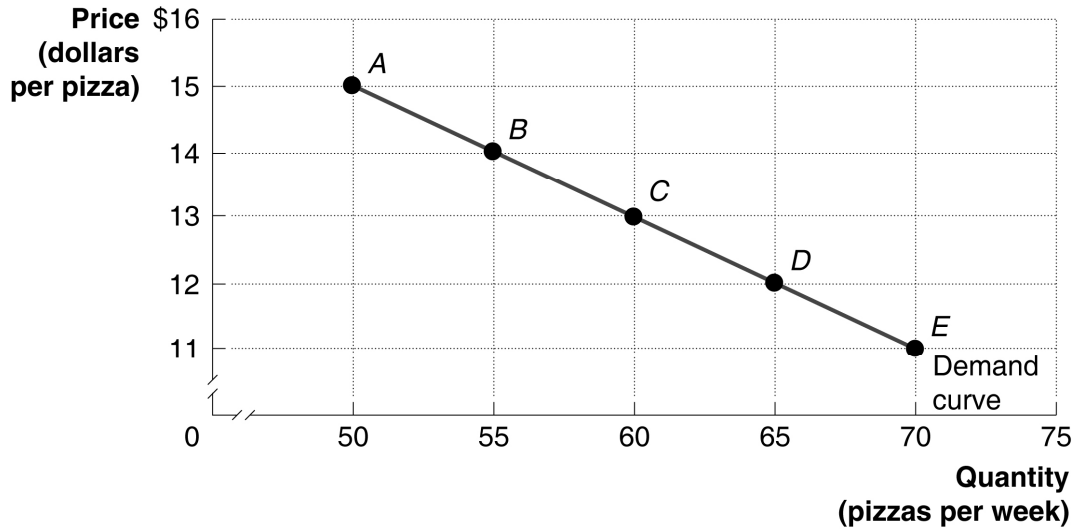


- a. The graph on the left
- b. The graph on the right
- c. Both graphs
- d. Neither graph

31. Fill in the blanks. The slope of a straight line equals the change in value on the _____ axis _____ by the change in the value of the other axis between any two points on the line.

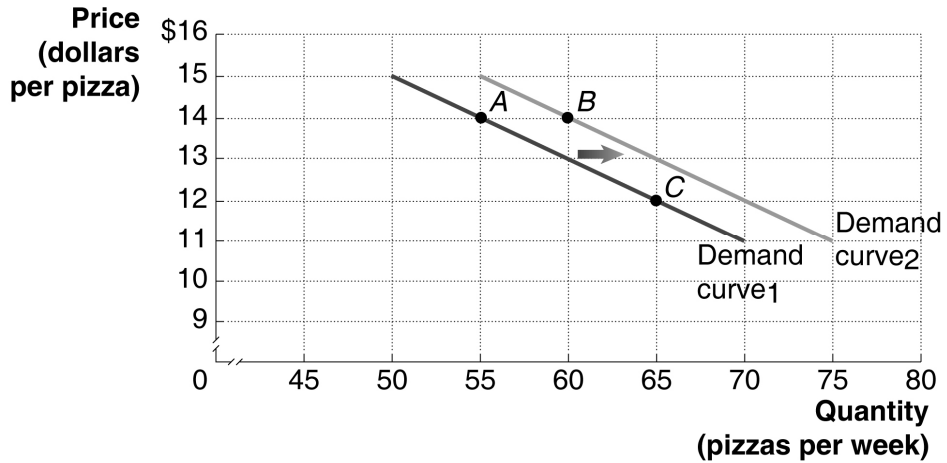
- a. horizontal; multiplied
- b. horizontal; divided
- c. vertical; multiplied
- d. vertical; divided

32. Refer to the graph below. What is the value of the slope of this line?



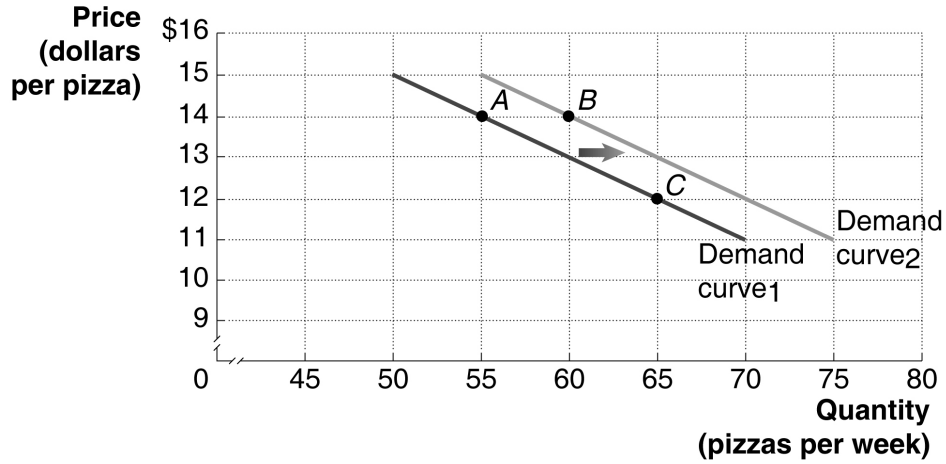
- a. -5
- b. -1/5
- c. -1
- d. There is insufficient information to compute the slope of this line.

33. Refer to the graph below. Which variable explains why the line shifts to the right?



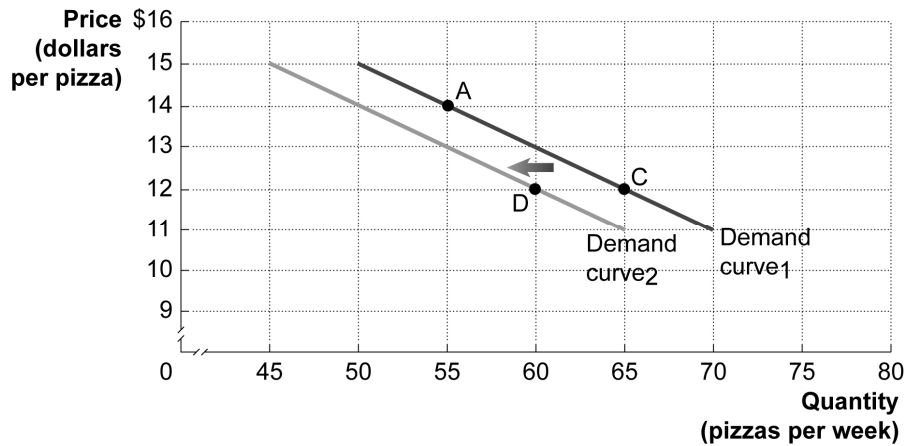
- a. The price of pizza
- b. The quantity of pizza
- c. A third variable other than the price or quantity of pizza
- d. All of the above.

34. Refer to the graph below. How many variables are involved in explaining the move from point *A* to point *C* on this graph?



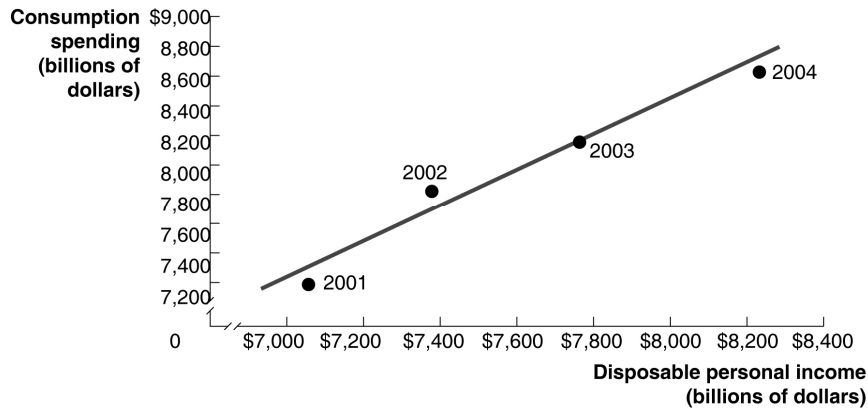
- a. One
- b. Two
- c. Three
- d. More than three, at least four.

35. Suppose that there are three variables involved in the graph below: (1) quantity, (2) price, and (3) a third variable. Which of those variables causes the move from point *A* to point *D* in the graph?



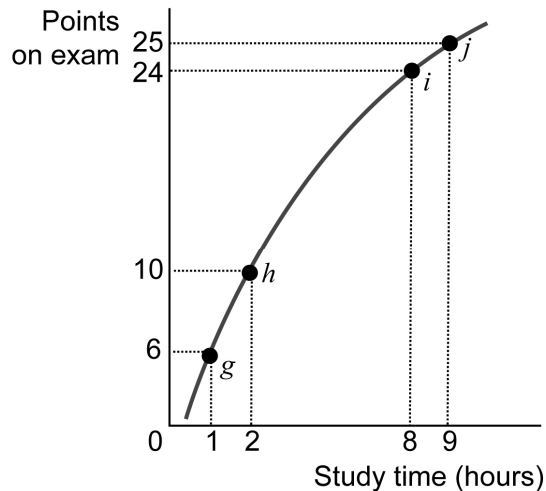
- a. The first variable, quantity.
- b. The second variable, price.
- c. The third variable.
- d. Either a. or b.

36. Refer to the graph below. What is the best descriptor of the relationship between disposable personal income and consumption spending?



- a. A positive relationship
- b. A negative relationship
- c. A relationship that is sometimes positive and sometimes negative
- d. A relationship that may be positive and negative, but sometimes neither positive nor negative

37. Refer to the graph below. What can be said about the value of the slope of this curve?

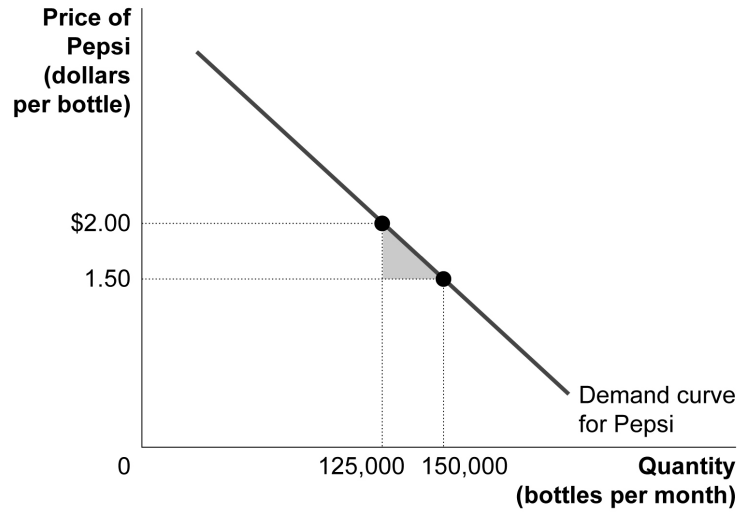


- a. The value of the slope is greater between points *i* and *j* than between points *g* and *h*.
- b. The value of the slope is greater between points *g* and *h* than between points *i* and *j*.
- c. The value of the slope is the same between any two points along the curve.
- d. It is difficult to establish the value of the slope because the relationship is not linear.

38. Let V_1 equal the value of a variable in period 1, and V_2 equal the value of the same variable in period 2. What is the rate of growth between periods 1 and 2?

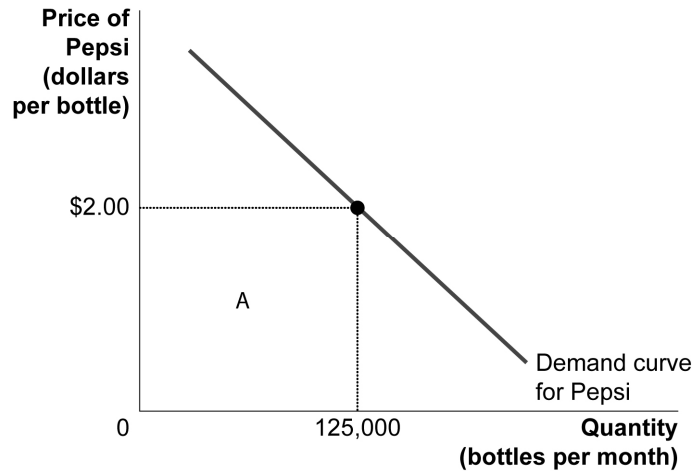
- a. $[(V_1 + V_2)/2] \times 100$
- b. $[(V_2 - V_1)/V_1] \times 100$
- c. $(V_2 - V_1)/(V_1 + V_2)$
- d. $V_2 - V_1$

39. Refer to the graph below. Which of the formulas below must you apply in order to compute the grey area shown on the graph?



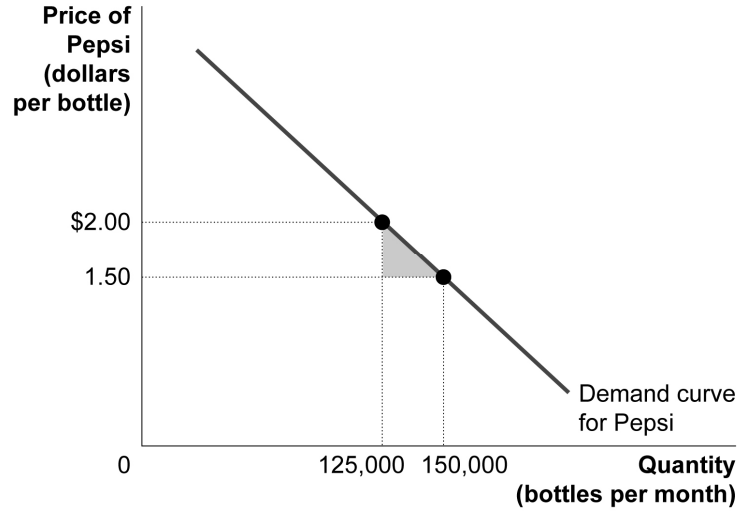
- a. Base x Height
- b. $\frac{1}{2} \times \text{Base} \times \text{Height}$
- c. Both of the above
- d. None of the above

40. Refer to the graph below. What is the name of the area contained in rectangle A?



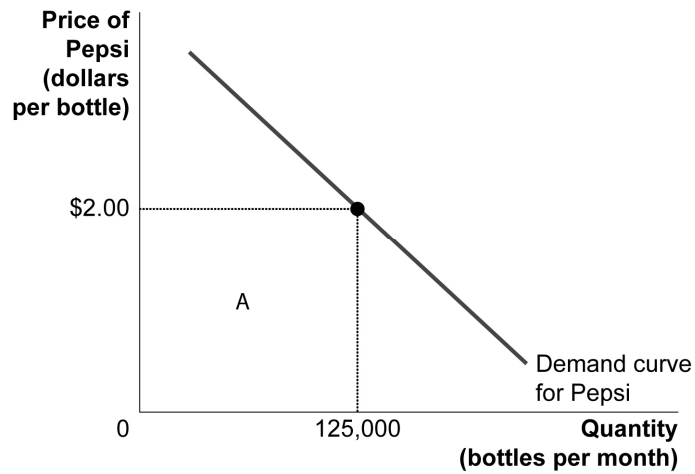
- a. Total cost
- b. Total revenue
- c. Price
- d. Average cost

41. Refer to the graph below. What is the value of the grey area shown on the graph?



- a. \$300,000
- b. \$225,000
- c. \$62,500
- d. \$6,250

42. Refer to the graph below. What is the value of the area contained in rectangle A?



- a. \$2.00.
- b. \$125,000
- c. \$250,000
- d. There is not enough information to determine the area.

Short Answer Questions

1. Why do economists distinguish between financial capital and physical capital?

2. Explain the difference between productive efficiency and allocative efficiency.

3. Economists rely on economic models and tests of hypotheses to analyze real-world issues. The use of models and hypothesis testing is common in the natural sciences such as physics and chemistry. Yet, economics is considered a social science, not a natural science. Why?

4. Write an example of a positive statement and an example of a normative statement.

5. Duncan Grant, a freshman economics student at John Borts University, claimed that fresh water is a necessity for all human beings. When asked by his economics instructor if he would be willing to buy a 16 ounce bottle of water for \$5.00, Duncan declined. What economic principle would explain Duncan’s refusal to buy something that he insists is a necessity?

True/False Questions

- T F 1. Stating a hypothesis in an economic model is an example of normative analysis.
- T F 2. An entrepreneur is someone who works for a government agency.
- T F 3. Economists assume that human beings respond only to economic incentives.
- T F 4. In a centrally planned economy the goods and services produced are always distributed equally to all citizens.
- T F 5. Equity is achieved when economic benefits are equally distributed.
- T F 6. A mixed economy is an economy in which the three fundamental questions (*What? How? Who?*) are answered by a mixture of consumers and producers.
- T F 7. Both market economies and centrally planned economies face trade-offs when producing goods and services.
- T F 8. When economists assume people are rational, this means that consumers and firms use available information in order to achieve their goals.
- T F 9. Government intervention in the United States economy increased dramatically as a result of the Great Depression.
- T F 10. Economists use normative analysis to argue that the minimum wage law causes unemployment.
- T F 11. Microeconomics is the study of how households and firms make choices, how they interact in markets and how the government attempts to influence their choices.
- T F 12. The slope of a straight line is the same at any point.
- T F 13. To measure the slope of a nonlinear curve at a particular point one must draw a straight line from the origin to the point. The slope of this line is equal to the slope of the curve at that point.
- T F 14. All societies face the economic problem of having a limited amount of economic resources.
- T F 15. Economic models can help analyze simple real-world economic situations but are of little value in analyzing complicated economic situations.

Answers to the Self-Test

Multiple-Choice Questions

Question	Answer	Comment
1	d	In this textbook, we use economics to answer questions such as those found in all of the choices given.
2	b	This is the textbook definition of scarcity.
3	b	The question is precisely the definition of a market.
4	d	The textbook presents three important ideas: People are rational; people respond to economic incentives; optimal decisions are made at the margin.
5	c	In solving the problem, consider that optimal decisions are made at the margin. An activity should be continued to the point where the marginal benefit is equal to the marginal cost.
6	c	The three questions are: What goods and services will be produced? How will the goods and services be produced? Who will receive the goods and services?
7	d	These questions refer to the economic problem <i>every</i> society must solve.
8	c	A centrally planned economy is an economy in which the government decides how economic resources will be allocated.
9	b	A mixed economy is an economy in which most economic decisions result from the interaction of buyers and sellers in markets, but where the government plays a significant role in the allocation of resources.

- 10 d Equity, or fairness, refers to the fair distribution of economic benefits.
- 11 b This is a state of the economy in which production reflects consumer preferences; in particular, every good or service is produced up to the point where the last unit produced provides a marginal benefit to consumers equal to the marginal cost of producing it.
- 12 c This is a situation that occurs in markets when both the buyer and the seller of a product are made better off by the transaction.
- 13 a This occurs when a good or service is produced at the lowest possible cost.
- 14 d Economic models are simplified versions of some aspects of economic life used to analyze an economic issue.
- 15 d Normative statements are not components of an economic model.
- 16 b An economic hypothesis is usually about a causal relationship, or how one thing causes another.
- 17 c Normative analysis is analysis concerned with “what ought to be.”
- 18 a Positive statements describe “what is.”
- 19 c This question objectively examines a relationship between tuition and class sizes, or “what is.”
- 20 d This is a question of “what ought to be.”
- 21 a Positive analysis uses economic models to estimate gains and losses. Positive questions are questions that can be tested.
- 22 b A normative statement is a matter of “what ought to be,” not “what is,” and this is determined by one’s values and beliefs.
- 23 a Microeconomics is the study of how households and businesses make choices, how they interact in markets, and how the government attempts to influence their choices.
- 24 b Macroeconomics is the study of the economy as a whole, including topics such as inflation, unemployment and economic growth.
- 25 a An invention is different from an innovation.
- 26 b An innovation is the application of an invention.
- 27 a In economics, capital refers to physical capital.
- 28 c Human and physical capital are used to produce goods and services.
- 29 d The bar chart, pie chart, and time series graph are all graphs of a single variable.
- 30 a This graph shows the relationship between two variables: price and quantity demanded.
- 31 d The slope of a line equals the value on the vertical axis divided by the value on the horizontal axis.
- 32 b Along this line, the value of the slope is the same between any two points. As an example, as we move from B (55, 14) to C (60, 13), the value of rise is $(13-14) = -1$ and the value of the run is $(55-60) = -5$. Then, the value of the slope is $-1/5$.
- 33 c Shifting a line involves taking into account more than two variables on a graph. In this case, something other than the price of pizza has changed, causing the demand curve to shift to the right, and showing the quantity of pizza demanded is greater for each of the prices shown.
- 34 a The movement from A to C is explained by one and only one thing: a change in price. The (price, quantity demanded) combination at A is different from that at C, but the movement from A to C is explained by a change in only one variable: price.
- 35 c A shift of the demand curve is caused by a change in something other than price, such as a change in income. For each price, quantity demanded is less than it was before.
- 36 a An upward sloping line shows that the relationship between two variables is positive, i.e. the variables change in the same direction.

- 37 b As you move upward along the curve, the value of the slope decreases. The slope between g and h is $(10-6)/(2-1) = 4$ and the slope between i and j is $(25-24)/(9-8) = 1$.
- 38 b This is the formula for computing a percentage change.
- 39 b You are computing the area of a triangle, which is $\frac{1}{2} \times \text{Base} \times \text{Height}$.
- 40 b Total revenue equals price \times quantity, which is the area of the rectangle (Base \times Height).
- 41 d The area of the triangle is $\frac{1}{2} \times (\$2.00 - \$1.50) \times (150,000 - 125,000) = \$6,250$.
- 42 c The area of the rectangle is equal to $\$2.00/\text{bottle} \times 125,000 \text{ bottles} = \$250,000$, which is $\$250,000$ in total revenue.

Short Answers

1. Economists distinguish financial capital and physical capital because only physical capital (for example, machinery, tools and buildings) is a productive resource. Financial capital includes stocks, bonds, and holdings of money. Financial capital is not part of a country's capital stock, because financial capital does not produce output.
2. Productive efficiency is the situation in which a good or service is produced at the lowest possible cost. Allocative efficiency is a state of the economy in which production reflects consumer preferences. Every good or service is produced to the point at which the last unit provides a marginal benefit to consumers equal to the marginal cost of producing it.
3. Economics, unlike physics and chemistry, is a social science because it applies the use of models and hypothesis testing to the study of the interactions of people.
4. Positive statements are statements or facts, or statements that can be proven to be correct or incorrect. Example: "Abraham Lincoln was the 15th president of the United States." (This is a false statement – Lincoln was the 16th president). A normative statement is an opinion or a statement of what should or ought to be. Example: "The United States should elect a female as president of the United States."
5. The principle that best describes Duncan's refusal to pay for the bottle of water is marginal analysis. The total benefit to people from fresh water is very high but the marginal benefit of water – the benefit to Duncan from an additional 16 ounces of water – is very low. Duncan probably is not very thirsty. If Duncan had not had anything to drink for two days the benefit to him of the next 16 ounces of water he drinks will be much higher.

True/False Answers

1. F A hypothesis is a testable statement about how the world is.
2. F An entrepreneur is someone who operates a business.
3. F Economists believe people respond to incentives.
4. F The distribution of goods and services is determined by the government and that need not be equal.
5. F People differ on what they believe is equitable or fair.
6. F A mixed economy is one in which government influence on the choices of buyers and sellers is greater than in a market economy.
7. T All economies face trade-offs due to scarce resources.
8. T
9. T See the section titled “The Modern ‘Mixed’ Economy” on page 10.
10. F Economists would use positive economics analysis to address this issue.
11. T This is the definition of microeconomics.
12. T
13. F The slope of a point on a nonlinear curve is measured by the slope of a tangent to the curve at that point.
14. T
15. F Economic models provide a basic foundation for use in the analysis of both simplistic and complicated economic situations.