

# Trade-offs, Comparative Advantage, and the Market System

## Chapter Summary

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A nation can produce only limited quantities of goods and services because it has scarce resources. Economists use the **production possibilities frontier (PPF)** to analyze the opportunity costs and trade-offs that nations, firms, and individuals face as a result of **scarcity**. The *PPF* is a curve that illustrates the combinations of two goods a nation can produce using all of its economic resources and a current state of technology in a given time period. The more resources that are devoted to an activity, the smaller the payoff to devoting additional resources to that activity. Production possibilities frontiers can be used to demonstrate the benefits of specialization in production and trade for two individuals or two nations.

**Markets** enable buyers and sellers of goods and services to come together to trade. The **circular-flow diagram** shows how buyers (households) and sellers (firms) interact in both product and factor markets. Free markets exist when governments place few restrictions on how a good or service can be produced and sold or on how a factor of production can be employed.

**Entrepreneurs**, those who own and operate businesses, are critical to the working of a market system. The businesses they operate produce goods and services consumers want. The entrepreneur decides how these goods and services should be produced to yield the most profit. Entrepreneurs organize factors of production and risk their own funds to start businesses. Successful entrepreneurs are rewarded for their efforts with profits, but most entrepreneurs, including many who later meet with success, suffer financial losses and business failures if they do not satisfy consumers' wants. Although government does not restrict how firms produce and sell goods and services in a free market, it is essential that government protect an individual's right to private property in order for a market system work well.

## Learning Objectives

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

1. **Use a production possibilities frontier to analyze opportunity costs and trade-offs.** Each point on a production possibilities frontier represents a combination of two goods that can be produced by using all of a nation's available resources given the state of technology and during a specific time period. Along the frontier, an increase in production of one good requires a decrease in production of the other good. Production possibilities frontiers usually appear bowed outward because marginal opportunity costs typically increase as the production of any good or service rises.

2. **Understand comparative advantage and explain how it is the basis for trade.** Comparative advantage explains why a person is better off specializing in the production of the good or service that he or she can produce at a lower opportunity cost than another person. Each person can then trade for the good or service the other person produces.
3. **Explain the basic idea of how a market system works.** In a market system, buyers and sellers in product markets and resource markets are free to trade with few restrictions on how a good or service can be sold or how a factor of production can be employed. Individual buyers and sellers are assumed to act in rational, self-interested ways.

## Chapter Review

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### Chapter Opener: Managers Making Choices at BMW (pages 36-37)

The managers at firms such as BMW (Bavarian Motor Works) must make decisions regarding the production and marketing of their products. These decisions include the location of manufacturing plants and the production methods used at these plants. Because BMW is a German firm, there are good reasons to locate factories in Germany. However, locating factories in other countries can reduce manufacturing costs (for example, by paying lower wages). Locating in countries where the automobiles are sold also reduces the risk that foreign governments will impose import restrictions.

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#### Helpful Study Hint

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The authors use a production possibilities frontier to illustrate BMW's decision to produce Z4 roadsters and X5 sports utility vehicles. See Figure 2-1. An *Inside Look* at the end of the chapter uses the concepts explained in the chapter to analyze BMW's production decisions during 2007. BMW generated a new production possibilities frontier (*PPF*) due to technological change and is moving in the direction of producing on the new *PPF*. As production increases, BMW is substituting the production of SUVs for coupes.

*Economics in YOUR Life!* “The Trade-offs When You Buy a Car” asks whether there is a relationship between gas mileage and safety and whether we can increase both safety and the mileage. Keep this question in mind as you read the chapter. The authors will answer this question at the end of the chapter.

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## 2.1 LEARNING OBJECTIVE

### 2.1 Production Possibilities Frontiers and Opportunity Costs (pages 38-44)

**Learning Objective 1** Use a production possibilities frontier to analyze opportunity costs and trade-offs.

A **production possibilities frontier** (*PPF*) is a curve showing the maximum alternative combinations of two products that may be produced with available resources. The slope of a *PPF* is used to measure the opportunity cost of increasing the production of one good along the frontier relative to the other good.

The slope of a linear frontier and the opportunity cost of moving along the frontier are constant. But convex or “bowed out” production possibilities frontiers represent a more likely outcome. A convex *PPF* means marginal opportunity costs rise as more and more of one good is produced. For example, starting from point *A* in Figure 2-2 and moving downward to points *B* and *C*, the slope of the frontier becomes steeper and steeper. This means that the cost of producing one more automobile (the number of tanks that must be given up as resources are transferred to automobile production) is greater at each point.

Along a production possibilities frontier, resources and technology are fixed. If there is an increase in the available resources or an improvement in the technology used to produce goods and services, the *PPF* will shift outward. The economy will be able to produce more goods and services, which means the economy has experienced economic growth. **Economic growth** is the ability of the economy to produce increasing quantities of goods and services. Growth may lead to greater increases in production of one good than another.

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### Helpful Study Hint

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Solved Problem 2-1 will help you draw a *PPF* and understand how a linear *PPF* illustrates opportunity costs incurred in production. Be sure you understand how slope is measured along the frontier and that this slope represents the opportunity cost of substituting the production of one good for the production of another.

***Making the Connection*** “Trade-offs: Hurricane Katrina, Tsunami Relief, and Charitable Giving” describes a sobering example of the opportunity cost of making donations to charitable organizations when aid is solicited as a result of a natural disaster. Households and firms typically have a fixed budget for charities, and contributions to one charitable cause will diminish the supply of funds available to another charitable cause. When natural disasters strike, the focus for charitable giving becomes the relief fund for that disaster and other charitable causes typically see a reduction in giving.

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## 2.2 LEARNING OBJECTIVE

## 2.2 Comparative Advantage and Trade (pages 44-49)

**Learning Objective 2** Understand comparative advantage and explain how it is the basis for trade.

By specializing in production and engaging in trade, individuals can enjoy a higher standard of living than would be possible if these individuals produced everything they consumed. Specialization in production is so common that most people take for granted that they must trade income earned from their own labor to buy the services of plumbers, carpenters, medical doctors, and stock brokers. Specialization makes trade necessary. **Trade** is the act of buying or selling.

**Absolute advantage** is the ability of an individual, firm, or country to produce more of a good or service than competitors using the same amount of resources. **Comparative advantage** is the ability of an individual, firm, or country to produce a good or service at a lower opportunity cost than other producers. An individual country should specialize in the production of the good or services in which it has a comparative advantage, and then trade this good to other countries for goods in which it does not have a comparative advantage.

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 Helpful Study Hint

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***Don't Let This Happen to You!*** clarifies the differences between absolute and comparative advantage using the example of individuals picking apples and picking cherries. A country has the absolute advantage in the production of a good if the country can produce more of the good, while the comparative advantage in the production of a good goes to the country that can produce the good relatively inexpensively (that is, with the lower opportunity cost). In the simple case with two goods, a country can have an absolute advantage in the production of both goods, but the country will only have a comparative advantage in the production of only one of the two goods.

***Solved Problem 2-2*** describes the benefits realized when a nation specializes in the production of a good for which it has a comparative advantage. In the problem, the United States has a comparative advantage in producing honey, while Canada has a comparative advantage in producing maple syrup. Each country should specialize in producing the good for which it has a comparative advantage and trade some of that good for the other good. With trade, the United States and Canada can consume outside of their *PPFs*.

Most examples of absolute and comparative advantage are similar to the hypothetical examples in section 2.2 of the textbook. This is due, in part, to the difficulty of identifying people who have an absolute advantage in two different areas. But the career of Babe Ruth offers a good example of someone with an absolute advantage in two activities who was still ultimately better off specializing in the activity in which he had a comparative advantage. Before he achieved his greatest fame as a home run hitter and outfielder with the New York Yankees, Ruth was a star pitcher with the Boston Red Sox. Ruth may have been the best left-handed pitcher in the American League during his years with Boston (1914-1919), but he was used more and more as a fielder in his last two years with the team. In fact, he established a record for home runs in a season (29) in 1919 when he was still pitching. The Yankees acquired Ruth in 1920 and made him a full-time outfielder. The opportunity cost of this decision for the Yankees was the wins Ruth could have earned as a pitcher. But because New York already had skilled pitchers, the opportunity cost of replacing Ruth as a pitcher was lower than the cost of replacing him as a hitter. No one else on the Yankees could have hit 54 home runs, Ruth's total in 1920; the next highest Yankee total was 11. It can be argued that Ruth had an absolute advantage as both a hitter and pitcher in 1920 but a comparative advantage only as a hitter.

## 2.3 LEARNING OBJECTIVE

## 2.3 The Market System (pages 50-56)

**Learning Objective 3** Explain the basic idea of how a market system works.

A **market** is a group of buyers and sellers of a good or service and the institution or arrangement by which they come together to trade. **Product markets** are markets for goods, such as computers, and services, such as medical treatment. **Factor markets** are markets for the factors of production, such as labor, capital, natural resources, and entrepreneurial ability. A **circular-flow diagram** is a model that illustrates how participants in markets are linked. The diagram demonstrates the interaction between firms and households in both product and factor markets. Households buy goods and services in the product market and provide resources for sale in the factor market, while firms provide goods and services in the product market and buy resources in the factor market. A **free market** is a market with few government restrictions on how a good or service can be produced or sold, or on how a factor of production can be employed.

Entrepreneurs are an essential part of a market economy. An **entrepreneur** is someone who operates a business, bringing together the factors of production – labor, capital, and natural resources – to produce goods and services. Entrepreneurs often risk their own funds to start businesses and organize factors of production to produce those goods and services consumers want.

The role of government in a market system is limited but essential. Although government in a market economy imposes few restrictions on the choices made by consumers, resource owners, and firms, government protection of private property rights is necessary for markets to operate efficiently.

**Property rights** are the rights individuals or firms have to the exclusive use of their physical and intellectual property, including the right to buy or sell it. New technology has created challenges to protection of property rights. Unauthorized copying of music and other intellectual property in cyberspace reduces the rewards to creativity and may reduce the amount of such activity in the future.

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 **Helpful Study Hint**

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Consumers seldom know the identity of the people who produce the products they buy. The impersonal and decentralized character of markets is illustrated very well by the discussion of the production of Apple's iPod found in *Making the Connection* "A Story of the Market System in Action: How Do You Make an iPod?" The iPod contains 451 parts. Many of the manufacturers of the components of the iPod do not know what the final product will be. No one person at Apple knows how to produce all of these components, so Apple relies heavily on its suppliers.

The role of government in a free market economy can be compared to that of an umpire or referee in a sporting event. The most vocal critics of these officials would not argue they are not needed. It would not take long for a professional football or baseball game to turn into a shouting match (or worse!) if players were allowed to enforce the rules of their own games. On the other hand, the quality of sporting events suffers when officials bar players, coaches, or managers from participating in contests for frivolous reasons. *Making the Connection*

“Property Rights in Cyberspace: YouTube and MySpace” reinforces the need for government protection of property rights and the difficulties associated with enforcing intellectual property rights. Material can easily be uploaded to and posted on the Internet. Once on the Internet, the material can be easily downloaded, reproduced, reposted, and the like. It is highly unlikely that you will get caught for piracy when reproducing the material for your personal use, so these intellectual property rights are nearly impossible to protect.

The stories of successful businesses such as Microsoft and Google can give a misleading impression about the risks of business ownership. Many businesses fail. The National Restaurant Association estimates an 80 percent failure rate for independently owned restaurants within their first two years of operation. The average work week for many small business owners is much longer than that of the average employee – 80 hours is not uncommon – and owners often borrow heavily to start and maintain their businesses.

At the start of the chapter, *Economics in YOUR Life!* “The Trade-offs When You Buy a Car” asks whether there is a relationship between gas mileage and safety and whether we can increase both safety and the mileage rate. You can analyze these questions using a *PPF*. The trade-off between safety and gas mileage can be depicted by looking at a given *PPF*. We know that bigger, heavier cars are safer, but they also have worse gas mileage. We could get a combination of safety and fuel mileage that is outside the given *PPF* by improvements in the technology used in manufacturing automobiles. This would give us a new *PPF* and an increase in both safety and gas mileage.

## Extra Solved Problem 2-3

*The chapter includes 2 Solved Problems. Here is an extra Solved Problem to help you build your skills solving economic problems.*

**Supports Learning Objective 2-3:** Explain the basic idea of how a market system works.

### *Adam Smith’s “Invisible Hand”*

Alan Krueger, an economist at Princeton University, has argued that Adam Smith “...worried that if merchants and manufacturers pursued their self-interest by seeking government regulation and privilege, the invisible hand would not work its magic...”

Source: Alan B. Krueger, “Rediscovering the Wealth of Nations,” *New York Times*, August 16, 2001.

- a. What types of regulation and privilege might merchants and manufacturers seek from the government?
- b. How might these regulations and privileges keep the invisible hand from working?

## SOLVING THE PROBLEM

**Step 1: Review the chapter material.**

This problem is about how goods and services are produced and sold and how factors of production are employed in a free market economic system as described by Adam Smith in *An Inquiry into the Nature and Causes of the Wealth of Nations*. You may want to review the section “The Gains from Free Markets,” which begins on page 52 in the textbook.

**Step 2: Answer question (a) by noting the economic system in place in Europe in 1776.**

At that time, governments gave guilds – associations of producers – the authority to control production. The production controls limited the amount of output of goods such as shoes and clothing as well as the number of producers of these items. Limiting production and competition led to higher prices and fewer choices for consumers. Instead of catering to the wants of consumers, producers sought the favor of government officials.

**Step 3: Answer question (b) by contrasting the behavior of merchants and manufacturers under a guild system and a market system.**

Because governments gave producers the power to control production, producers did not have to respond to consumers’ demands for better quality, more variety, and lower prices. Under a market system, producers who sell goods of poor quality at high prices suffer economic losses; producers who provide better quality goods at low prices are rewarded with profits. Therefore, in a market system it is in the self-interest of producers to address consumer wants. This is how the invisible hand works in a free market economy, but not in eighteenth century Europe.

## Key Terms

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**Absolute advantage.** The ability of an individual, firm, or country to produce more of a good or service than competitors, using the same amount of resources.

**Circular-flow diagram.** A model that illustrates how participants in markets are linked.

**Comparative advantage.** The ability of an individual, firm, or country to produce a good or service at a lower opportunity cost than competitors.

**Economic growth.** The ability of the economy to produce increasing quantities of goods and services.

**Entrepreneur.** Someone who operates a business, bringing together the factors of production – labor, capital, and natural resources – to produce goods and services.

**Factor markets.** Markets for the factors of production, such as labor, capital, natural resources, and entrepreneurial ability.

**Factors of production.** The inputs used to make goods and services.

**Free market.** A market with few government restrictions on how a good or service can be produced or sold or how a factor of production can be employed.

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

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

**Product markets.** Markets for goods – such as computers – and services – such as medical treatment.

**Production possibilities frontier (PPF).** A curve showing the maximum attainable combinations of two products that may be produced with available resources and current technology.

**Property rights.** The rights individuals or firms have to the exclusive use of their property, including the right to buy or sell it.

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

**Trade.** The act of buying or selling.

## Self-Test

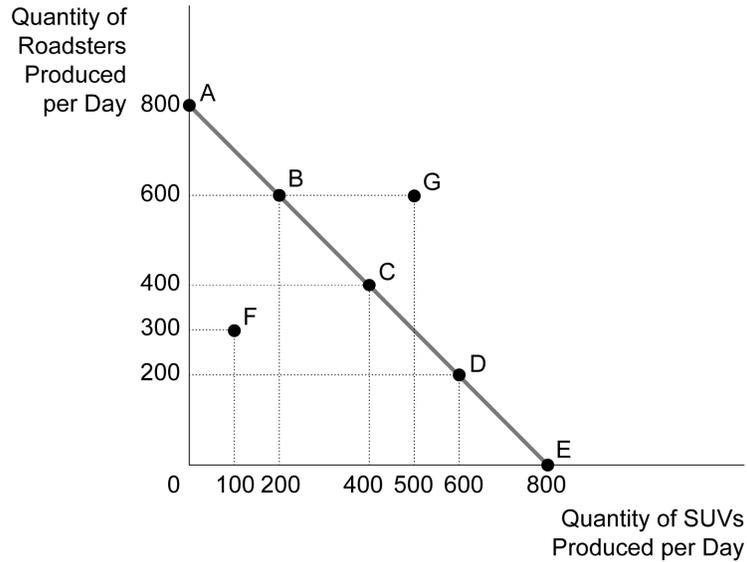
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*(Answers are provided at the end of the Self-Test.)*

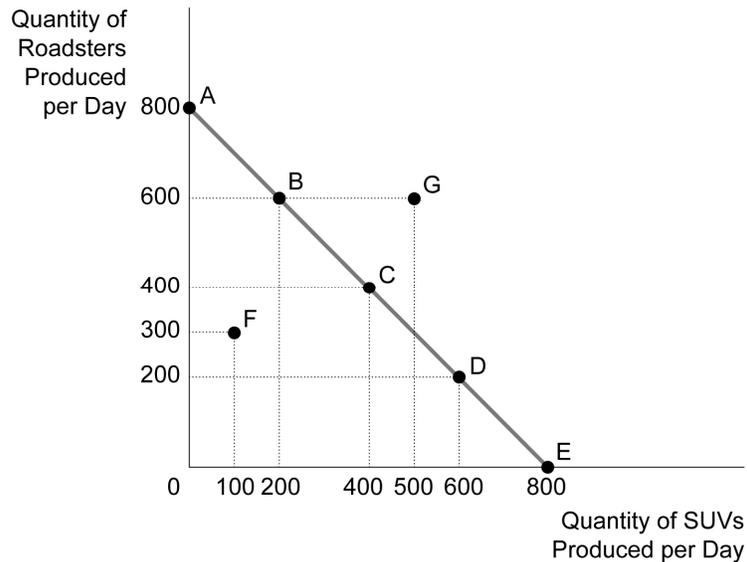
### Multiple-Choice Questions

1. What is the name given to the highest-valued alternative that must be given up to engage in any activity?
  - a. Scarcity
  - b. The production possibilities frontier
  - c. Opportunity cost
  - d. A tradeoff
2. What happens if a country produces a combination of goods that uses all of the resources available in the economy?
  - a. The country is operating on its production possibilities frontier.
  - b. The country is maximizing its opportunity cost.
  - c. The country has eliminated scarcity.
  - d. All of the above

3. Refer to the graph below. Which of the following combinations is unattainable with the current resources available in this economy?

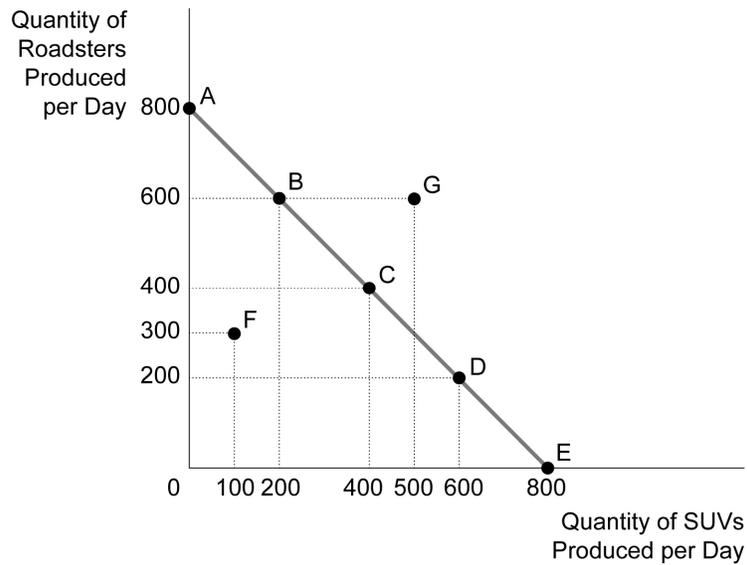


- Combination G
  - Combination F
  - Combinations A or E
  - All of the above. None of the combinations above can be attained with current resources.
4. Refer to the graph below. Which of the following combinations is inefficient?

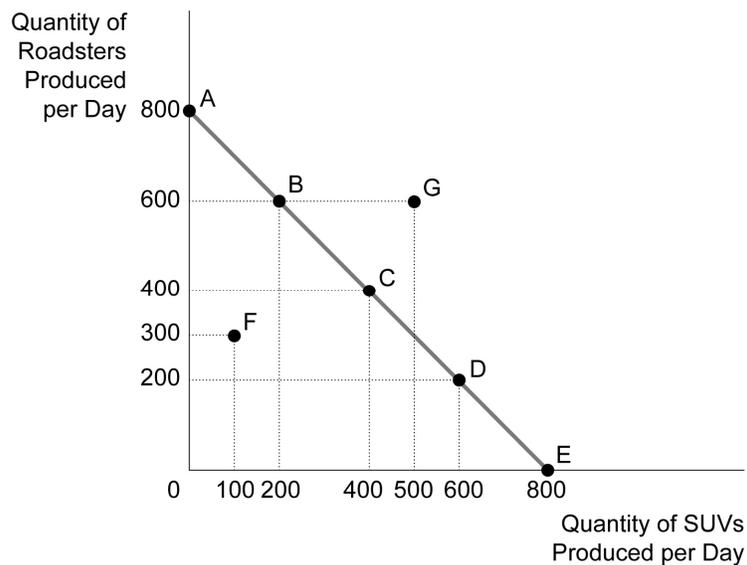


- Combination G
- Combination F
- Combinations A or E
- Both F and G

5. Refer to the graph below. Which of the following best represents the situation in which BMW *must* face a tradeoff between producing SUVs and producing roadsters?

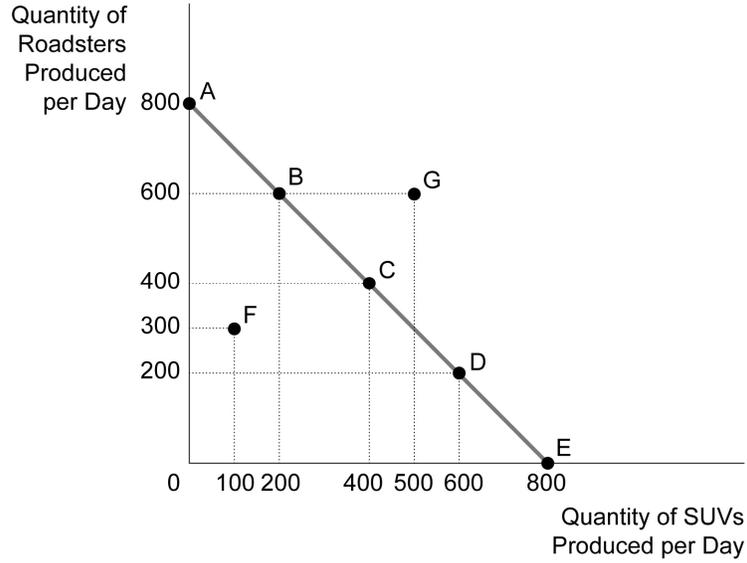


- Any point on the graph represents that tradeoff.
  - Moving from B to C
  - Moving from F to B
  - Moving from C and G
6. Refer to the graph below. How many roadsters are produced at the point where BMW produces 800 SUVs?



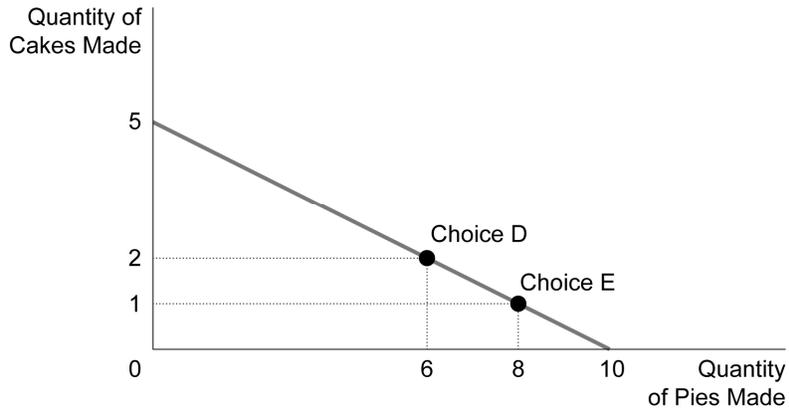
- Zero
- Any amount up to 800
- Exactly 800
- 400

7. Refer to the graph below. What is the opportunity cost of moving from point B to point C?



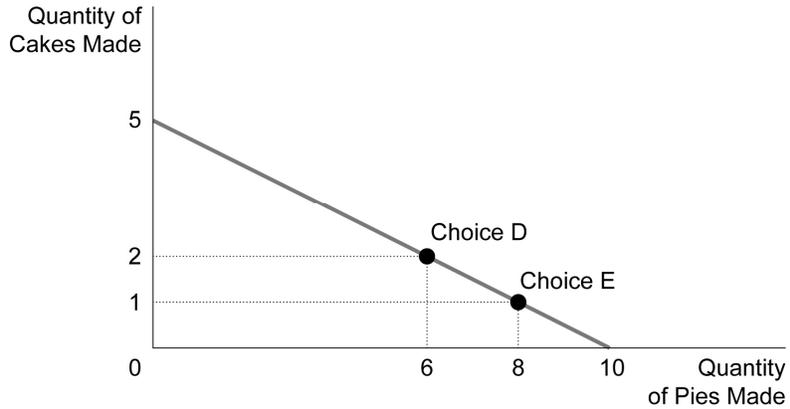
- a. 200 SUVs
- b. 400 SUVs
- c. 200 roadsters
- d. 400 roadsters

8. Refer to the graph below. The graph shows the data from Solved Problem 2-1. What is the opportunity cost of switching from Choice D to Choice E?

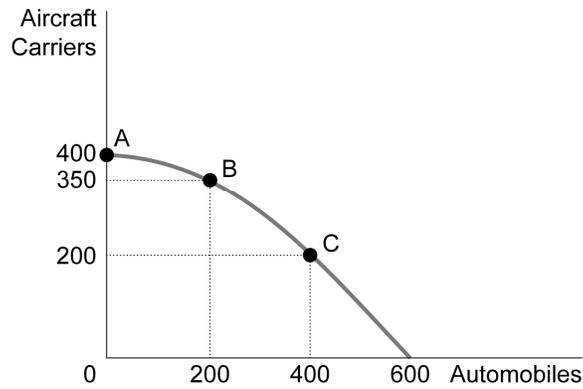


- a. Two pies
- b. Eight pies
- c. Two cakes
- d. One cake

9. Refer to the graph below. The graph is a representation of the data in Solved Problem 2-1. In this problem, what is the opportunity cost of producing five cakes?

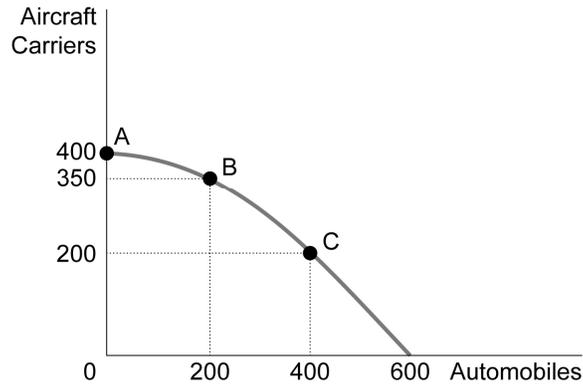


- a. Zero cakes
  - b. Zero pies
  - c. Ten pies
  - d. There is insufficient information to answer the question.
10. Refer to the graph below. As you move from point A to point B and then to C on this graph, what happens to the marginal opportunity cost?



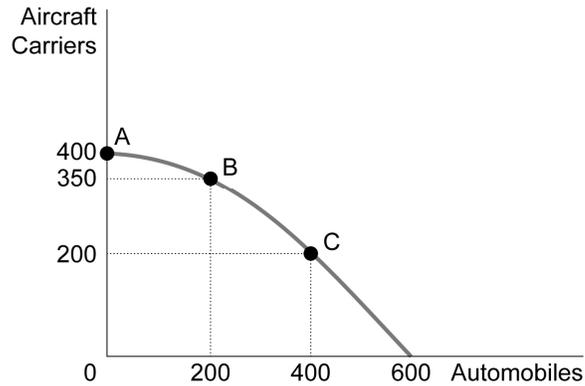
- a. It increases
- b. It decreases
- c. It remains constant
- d. It equals zero

11. Refer to the graph below. What is the opportunity cost of producing 400 aircraft carriers?



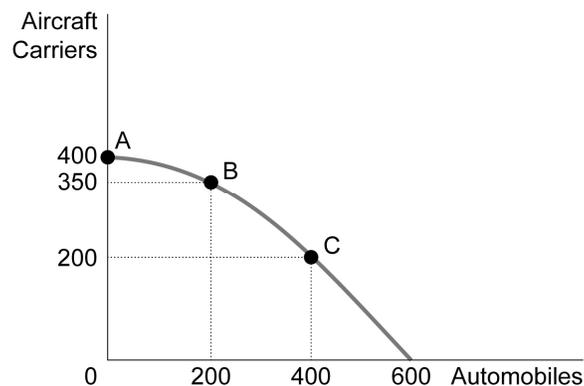
- a. 200 automobiles
- b. 50 aircraft carriers
- c. 200 automobiles
- d. 600 automobiles

12. Refer to the graph below. What is the opportunity cost of moving from point B to point C?



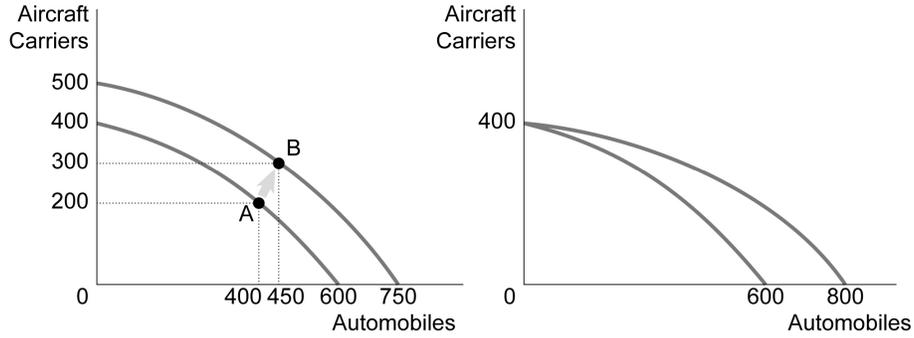
- a. 200 automobiles
- b. 400 automobiles
- c. 50 aircraft carriers
- d. 150 aircraft carriers

13. Refer to the graph below. Precisely what does the term “increasing marginal opportunity cost” mean in this graph?



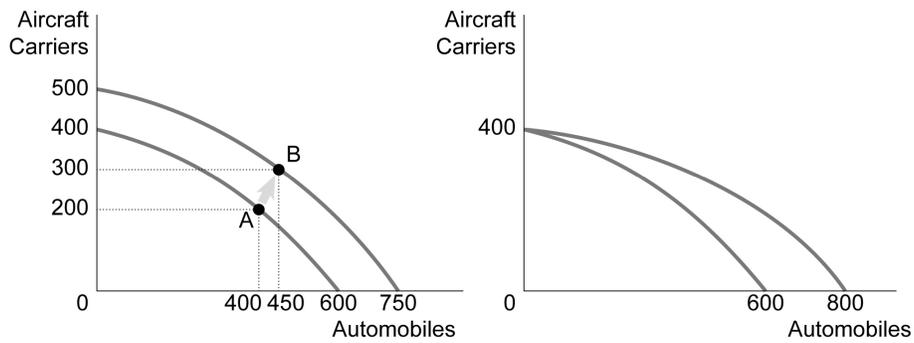
- a. It means that there is a higher opportunity cost of producing either aircrafts or automobiles, so long as the quantity produced of that good is decreasing.
  - b. It means that there is a higher opportunity cost of producing either aircrafts or automobiles, so long as the quantity produced of that good is increasing.
  - c. It means that increasing the production of aircrafts results in higher automobile production costs, such as the costs of labor and capital to build automobiles.
  - d. It means that increasing the production of either aircrafts or automobiles creates more opportunities in the economy.
14. A production possibilities frontier will be linear instead of bowed out if
- a. the tradeoff between the two goods is always constant.
  - b. no tradeoffs exist.
  - c. unemployment is zero.
  - d. resources are employed efficiently.
15. The principle of increasing marginal opportunity cost states that the more resources devoted to any activity, the \_\_\_\_\_ the payoff to devoting additional resources to that activity.
- a. smaller
  - b. greater
  - c. proportional
  - d. more instant

16. Refer to the graphs below. Which graph best represents an improvement in the technology used to make automobiles?



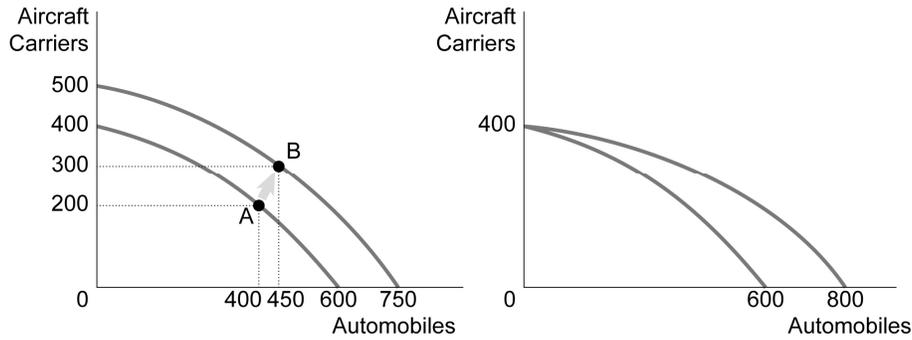
- a. The graph on the left
- b. The graph on the right
- c. Both graphs
- d. Neither graph

17. Refer to the graphs below. Which graph best represents an increase in the economy's resources?



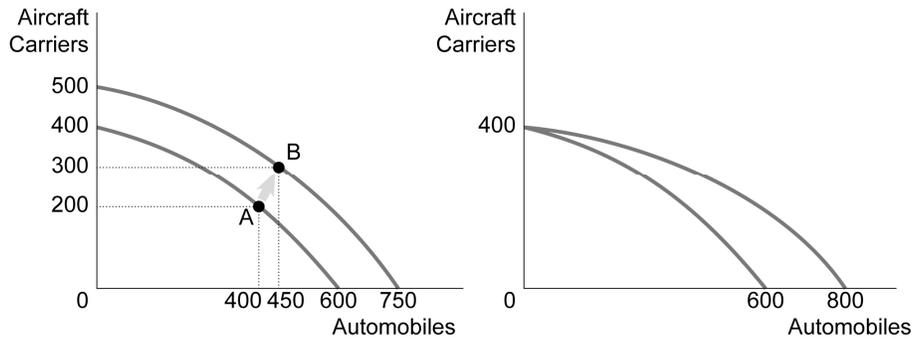
- a. The graph on the left
- b. The graph on the right
- c. Both graphs
- d. Neither graph

18. Refer to the graphs below. Which graph best represents the concept of *economic growth*?



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

19. Refer to the graphs below. Which of the following could have caused the outward shift of the curve in the graph on the left side?

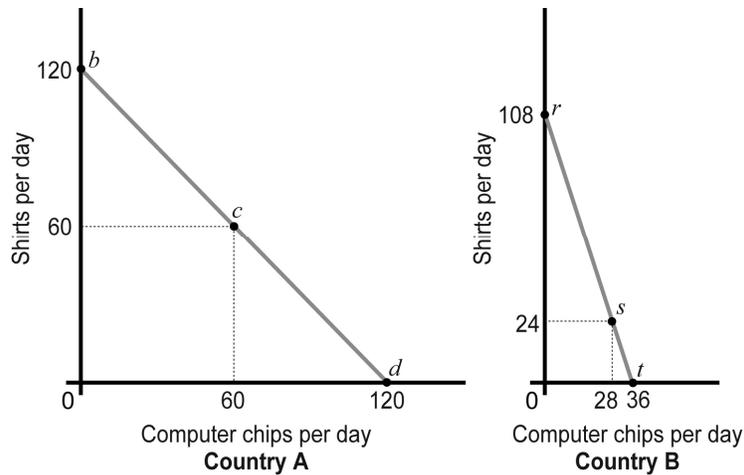


- a. An increase in technology that affects the production of both aircraft carriers and automobiles.
- b. Technological change that affects only the aircraft carrier industry.
- c. Unemployment in the economy
- d. A change in the cost of producing automobiles.

20. Which of the following would create economic growth, that is, shift the production possibilities frontier outward?

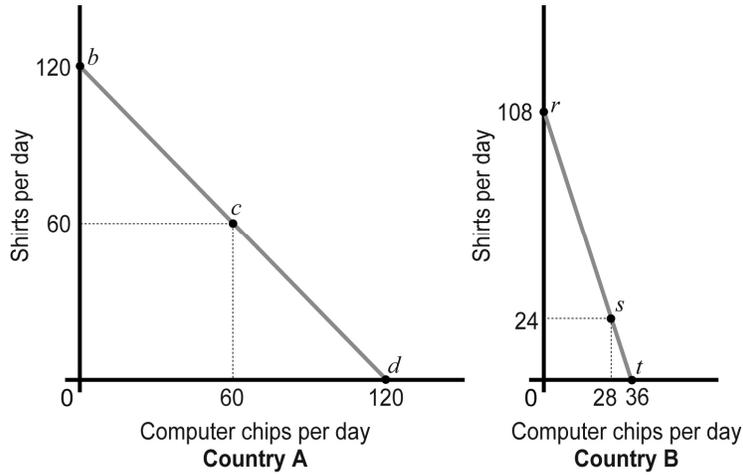
- a. An increase in the available labor.
- b. An increase in technology that affects the production of both goods.
- c. An increase in the available natural resources.
- d. All of the above

21. According to textbook section 2.2 on trade, which of the following statements is most consistent with positive economic analysis?
- The United States would be better off being self-sufficient, so we don't have to rely on other nations for certain goods.
  - The United States would be better off if we specialize in the production of some goods, and then trade some of them to other countries.
  - We should produce at home the goods that we now import—that way we can generate additional jobs here at home.
  - We should establish trade with friendly countries and avoid trade with our enemies.
22. *Absolute advantage* is the ability of an individual, firm, or country to
- produce more of a good or service than competitors using the same amount of resources.
  - produce a good or service at a lower opportunity cost than other producers.
  - consume more goods or services than others at lower costs.
  - reach a higher production possibilities frontier by lowering opportunity costs.
23. If a country has a *comparative advantage* in the production of a good, then that country
- also has an absolute advantage in producing that good.
  - should allow another country to specialize in the production of that good.
  - has a lower opportunity cost in the production of that good.
  - All of the above
24. Refer to the graphs below. Each graph represents one country. Which country has a comparative advantage in the production of shirts?



- Country A
- Country B
- Neither country
- Both countries

25. Refer to the graphs below. Each graph represents one country. Which country should specialize in the production of chips?



- Country A
  - Country B
  - Neither country; they both should produce some chips and some shirts.
  - Both countries should specialize in the production of chips.
26. The table below shows the quantity of two goods that a worker can produce per day in a given country. Which country has an *absolute advantage* in the production of each good?

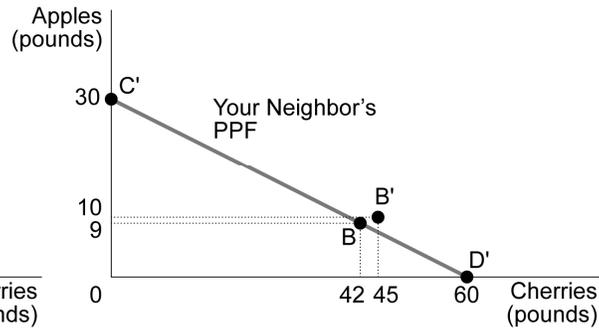
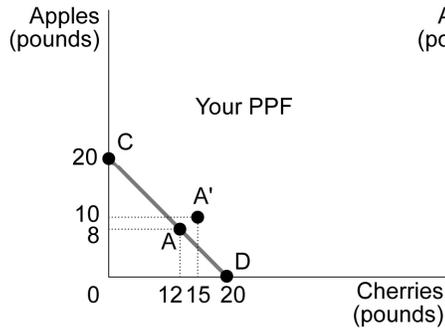
	Output per day of work	
	Food	Clothing
Country A	6	3
Country B	1	2

- Country A has an absolute advantage in the production of each good.
  - Country B has an absolute advantage in the production of each good.
  - Both countries have an absolute advantage in the production of each good.
  - Neither country has an absolute advantage in the production of each good.
27. Consider the table below. Which country has a *comparative advantage* in the production of each good?

	Output per day of work	
	Food	Clothing
Country A	6	3
Country B	1	2

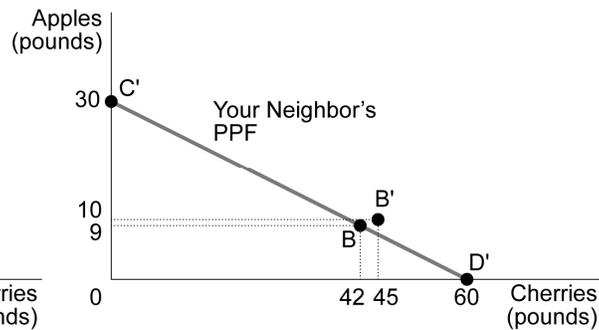
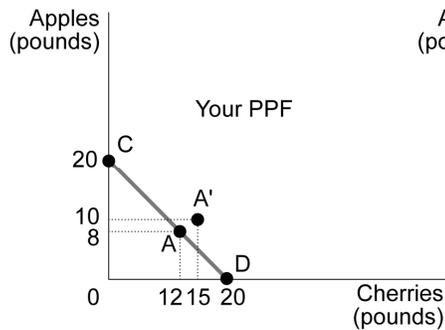
- Country A has a comparative advantage in the production of both goods.
- Country B has a comparative advantage in the production of both goods.
- Country A has a comparative advantage in the production of food.
- Country B has a comparative advantage in the production of food.

28. Refer to the graphs below. If you have a comparative advantage in the production of apples, what point would best represent your production with trade?



- a. A
- b. A'
- c. C
- d. D

29. Refer to the graphs below. What is point B' on your neighbor's PPF curve?



- a. Point B' is your neighbor's production before trade.
- b. Point B' is your neighbor's consumption before trade.
- c. Point B' is your neighbor's production after trade.
- d. Point B' is your neighbor's consumption after trade.

30. Which of the following refers to markets where goods such as computers or services such as medical treatment are offered?

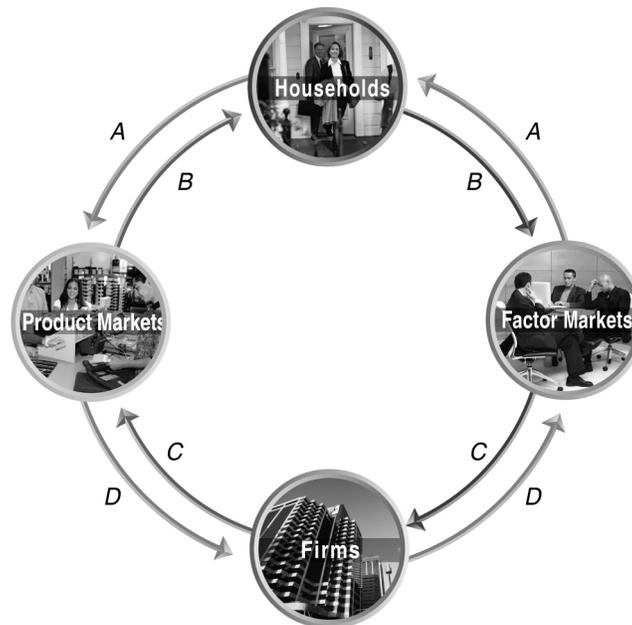
- a. Product markets
- b. Essential markets
- c. Factor markets
- d. Competitive markets

31. In which markets are factors of production, such as labor, capital, natural resources, and entrepreneurial ability traded?

- a. In product markets
- b. In essential markets
- c. In factor markets
- d. In competitive markets

32. Which of the following comprises the two key groups of participants in the circular flow of income?
- Product markets and factor markets
  - Government and the financial sector
  - Households and firms
  - Buyers and sellers

33. Fill in the blanks. In a simple circular flow model, there are flows of \_\_\_\_\_ and flows of \_\_\_\_\_.
- factors of production; goods and services
  - funds received from the sale of factors of production; spending on final goods and services
  - Both of the above are correct.
  - None of the above. Actually, there are no flows in the circular flow of income.



34. In the circular-flow diagram above, which arrow shows the flow of goods and services?
- A
  - B
  - C
  - D
35. In the circular-flow diagram above, which arrow shows the flow of spending by households?
- A
  - B
  - C
  - D

36. In the circular-flow diagram on the previous page, which arrow shows the flow of factors of production?
- A
  - B
  - C
  - D
37. In the circular-flow diagram on the previous page, which arrow shows the flow of income paid to the factors of production?
- A
  - B
  - C
  - D
38. According to Adam Smith, which of the following is true?
- Markets work because producers, aided by government, ensure that neither too many nor too few goods are produced.
  - Market prices can come to reflect the prices desired by all consumers.
  - Individuals usually act in a rational, self-interested way.
  - All of the above.
39. According to Adam Smith, which of the following is the instrument the invisible hand uses to direct economic activity?
- Price
  - Government regulation
  - Financial markets
  - Cost
40. According to Adam Smith, which of the following is necessary for the proper functioning of the market system?
- For markets to work, people should take into account how their decisions affect society as a whole.
  - For markets to work, government should help citizens make the right decisions.
  - For markets to work, people must be free to pursue their self-interest.
  - For markets to work, people and government need to coordinate their decisions.
41. What is the role of an entrepreneur?
- To operate a business that produces a good or service.
  - To bring together the factors of production—labor, capital, and natural resources.
  - To take risks.
  - All of the above
42. In a free market system, which of the following groups brings together the factors of production—labor, capital, and natural resources—in order to produce goods and services?
- The government
  - Entrepreneurs
  - Lobbyists
  - Politicians

- 43. Which of the following is critical for the success of a market system?
  - a. To allow individuals or firms to have exclusive use of their property.
  - b. To prevent individuals from buying or selling their property depending on the circumstances.
  - c. Either choice above.
  - d. To allow the government to determine the optimal use of private property.
  
- 44. Generally speaking, for a market system to work, individuals must
  - a. be very cautious in their approach to saving and investment.
  - b. take risks and act in rational, self-interested ways.
  - c. be able to evaluate and understand all available options.
  - d. consult people who have experience.
  
- 45. What are patents and copyrights designed to do?
  - a. Prevent entrepreneurs from earning excessive profits.
  - b. Eliminate unnecessary duplication whenever it arises.
  - c. Protect intellectual property rights.
  - d. All of the above
  
- 46. What is the outcome of enforcing contracts and property rights in a market system?
  - a. Increased economic activity
  - b. Decreased economic activity
  - c. No change or no effect on economic activity
  - d. An unpredictable but definite effect on economic activity
  
- 47. If a market system functions well, which of the following is necessary for the enforcement of contracts and property rights?
  - a. Powerful political connections
  - b. An independent court system
  - c. Action by government to prevent the exercise of certain property rights
  - d. All of the above

**Short Answer Questions**

- 1. Does the story about Apple’s production of the iPod imply that people must cooperate with one another in order for specialization in production and trade to occur? Explain.

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2. Comment briefly on the following statement: “The circular-flow diagram implies that the income household members receive is directly related to the market value of the resources they own.”

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3. How has the emergence of companies such as Napster and Kazaa changed the manner in which music companies and artists market their CDs?

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4. Some companies have had success selling goods and services through the Internet, but others have failed. What types of goods or services would consumers prefer to buy in stores rather than online?

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5. In the explanation of Adam Smith’s argument in favor of replacing the guild system with a market system, the textbook states that “*the key to understanding Smith’s argument is the assumption that individuals usually act in a rational, self-interested way.*” Did Smith believe that the success of a market system requires that people act selfishly?

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**True/False Questions**

- T F 1. In his book *An Inquiry into the Nature and Causes of the Wealth of Nations*, Adam Smith argued that a guild system was the most efficient way for a nation to coordinate the decisions of buyers and sellers.
- T F 2. The story about Apple’s production of the iPod shows how production requires the coordinated activities of many people, spread around the world.
- T F 3. A nation with an absolute advantage in the production of two goods will usually have a comparative advantage in only one of the goods.

- T F 4. A production possibilities frontier that is bowed outward illustrates increasing marginal opportunity costs.
- T F 5. Technological advances always benefit the production of all goods and services equally.
- T F 6. It is possible to have an absolute advantage in producing a good without having a comparative advantage.
- T F 7. Households are suppliers of the factors of production that are used by firms to produce goods and services.
- T F 8. The circular-flow diagram is used to explain why the opportunity cost of increasing the production of one good is the decrease in production of another good.
- T F 9. The 5<sup>th</sup> and 14<sup>th</sup> amendments to the U.S. Constitution guarantee property rights.
- T F 10. Opportunity cost refers to the all of the alternatives that must be given up to engage in an activity.
- T F 11. The popularity of Napster and Kazaa was due to the difficulty music companies and artists had in protecting intellectual property rights.
- T F 12. Private contributions to the relief effort following the December 2004 tsunami led to an increase in donations for the homeless and poor as donors realized the need to fund other charities.
- T F 13. Because the governments of Hong Kong, Estonia, and Singapore impose few restrictions on economic activity, the economies of these countries approximate free market economies.
- T F 14. The Bavarian Motor Works Company has always produced its automobiles in Germany in order to supervise production and employ German workers, who have high levels of technical skills.
- T F 15. The marginal opportunity cost along a linear (straight-line) production possibilities frontier is constant.

## Answers to the Self-Test

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### Multiple-Choice Questions

Question	Answer	Comment
1	c	Opportunity cost is the highest-valued alternative that must be given up to engage in an activity. Refer to page 39 of the textbook.
2	a	The production possibilities frontier is a curve showing all the attainable combinations of two products that may be produced with available resources.
3	a	In order to produce the combination G, the economy needs more machines, more workers, or more of both.
4	b	This combination is attainable but inefficient because not all resources are being used. Refer to page 39 of the textbook.
5	b	A move along the curve shows the sacrifice associated with increasing the quantity of SUVs, or the amount by which roadsters will have to be reduced.
6	a	Point E describes this choice. Point E shows that 800 SUVs are produced when zero roadsters are produced.
7	c	Opportunity cost is what you sacrifice. As you move from point B to point C, the production of SUVs increases, and the quantity of roadsters sacrificed to do so is 200.
8	d	As you move from D to E, you increase the production of pies by 2 and sacrifice one cake. Refer to pages 40-41 of the textbook.
9	c	Opportunity cost is what you sacrifice. If Rosie produced zero cakes, Rosie could make 10 pies.

- 10 a The sacrifice associated with producing more automobiles is ever greater. Refer to Figure 2-2 on page 39.
- 11 d Either the economy produces 400 aircraft carriers or it produces 600 automobiles with the same amount of resources.
- 12 d The economy can now produce 400 automobiles instead of 200. In order to produce these additional 200 automobiles, the economy produces 200 aircraft carriers instead of 350 (an opportunity cost of  $350 - 200 = 150$  aircraft carriers).
- 13 b As the economy moves down the production possibilities frontier, it experiences increasing marginal opportunity costs because increasing automobile production by a given quantity requires larger and larger decreases in aircraft carrier production.
- 14 a A linear production possibilities frontier has a constant slope and, therefore, a fixed opportunity cost.
- 15 a This is the principle of increasing marginal opportunity cost.
- 16 b An improvement in the technology used to make automobiles causes a shift of the production possibilities frontier along the horizontal axis.
- 17 a This graph shows that something affects both the production of automobiles and the production of aircraft carriers, such as an increase in resources or better technologies.
- 18 c These graphs show an increase in the production of one or both goods. This increase in the productive capacity of the economy is referred to as *economic growth*.
- 19 a Economic growth is the ability of the economy to produce increasing quantities of goods and services.
- 20 d All of the above factors create economic growth.
- 21 b If a nation produced everything it consumed, it would not depend on any other nation for its livelihood. Although self-sufficiency sounds appealing, countries are better off if they specialize in the production of some products and trade some of them to other countries. Refer to the section of the book entitled “Comparative Advantage and the Gains From Trade” on page 47.
- 22 a Absolute advantage is the ability of an individual, firm, or country to produce more of a good or service than competitors using the same amount of resources.
- 23 c The country with a lower opportunity cost of production has a comparative advantage in the production of that good.
- 24 b The opportunity costs are as follows: The opportunity cost of shirts is: 1 chip for country A, and  $1/3$  chip for country B. The opportunity cost of chips is: 1 shirt for country A and 3 shirts for country B. Country B has a comparative advantage in the production of shirts because it sacrifices fewer chips to produce one shirt. Country B should therefore produce shirts.
- 25 a The opportunity costs are as follows: The opportunity cost of shirts is: 1 chip for country A, and  $1/3$  chip for country B. The opportunity cost of chips is: 1 shirt for country A and 3 shirts for country B. Therefore, country A has a comparative advantage (or lower opportunity cost) in the production of chips because it sacrifices fewer shirts to produce one chip. Country A should therefore produce chips.
- 26 a Country A can produce more food and more clothing in one day than Country B.
- 27 c A worker in Country A can produce 6 times as many units of food as a worker in Country B, but only 1.5 as many units of clothing. Country A is more efficient in producing food than clothing relative to Country B.
- 28 c If you have a comparative advantage in the production of apples, you would specialize entirely in the production of apples.
- 29 d After trade, you and your neighbor can consume more than you can produce.
- 30 a Goods and services are exchanged in product markets.

- 31 c The focus here is on the types of markets where households and firms interact. Read page 50.
- 32 c A household is all the individuals in a home. Firms are suppliers of goods and services.
- 33 c In the circular flow of income there are flows of funds and spending, and also flows of factors of production and goods and services.
- 34 b Goods and services flow from firms to the households through the product market.
- 35 a Spending on goods and services flows from households to firms through the product market.
- 36 c Factors of production flow from households to the firms through the factor market.
- 37 d Income flows from firms to the households through the factor market.
- 38 c Individuals usually act in a rational, self-interested way. Adam Smith understood that people's motives can be complex.
- 39 a Price represents both the value of the good to consumers and the cost (to producers) of making those goods.
- 40 c Individuals usually act in a rational, self-interested way. When people act in their own self-interest, the right quantity of goods will be produced.
- 41 d The role of an entrepreneur is to operate a business and take risks in bringing together the factors of production—labor, capital, and natural resources—in order to produce goods and services.
- 42 b In a market system, entrepreneurs bring together the factors of production—labor, capital, and natural resources—in order to produce goods and services.
- 43 a The legal basis for a successful market is property rights. Property rights are the rights individuals or firms have to the exclusive use of their property, including the right to buy or sell it.
- 44 b Risk taking is an essential ingredient of entrepreneurship and this risk taking is essential for the market system to function well.
- 45 c Property rights are very important in any modern economy.
- 46 a Much business activity involves someone agreeing to carry out some action in the future. For a market to work, business and individuals have to rely on contracts.
- 47 b Independence and impartiality on the part of judges are very important.

### Short Answer Responses

1. Cooperation is essential for specialization and trade but it is an impersonal cooperation. It is not necessary for business owners, workers, suppliers and consumers to know or see one another. In fact, many of these individuals can be located thousands of miles away from each other, live in different countries and speak different languages. Their cooperation is due to their self-interest, not their regard for one another's welfare.
2. This is true. In order for household members to earn income to buy the goods and services they want, they must first sell their resource services to firms who purchase these services in factor markets. The market value of factor services determines the income resource owners receive.
3. Traditional music companies face competition from firms such as Napster and Kazaa that can offer downloaded music at low prices. And consumers can purchase online one or two songs rather than the entire CD that contains the songs they want. Music companies must offer more attractive options for consumers and consider lowering prices on the CDs they sell. Artists can market directly to consumers through their own web sites rather than through music companies as they have done in the past.

4. Many consumers are reluctant to buy items they cannot see, touch or taste before buying. Clothing, food and automobiles are usually purchased after close inspection.
5. Smith did not believe that self-interest was the sole motive nor did he believe that self-interest was synonymous with selfishness. People are motivated by a broad range of factors, but when they buy and sell in markets, monetary rewards usually provide the most important motivation. Note that people may give to charity due to their own self-interest such as tax breaks and a good feeling about oneself.

### True/False Answers

1. F Adam Smith explained the inefficiencies of the guild system and explained how markets were more efficient.
2. T See Making the Connection “A Story of the Market System in Action: How Do You Make an iPod?” on page 53.
3. T A nation can only have the comparative advantage in the production of one of the two goods being compared.
4. T As the slope of the frontier becomes steeper, the opportunity cost of obtaining one more unit of one good increases.
5. F Technological advances often affect the production of some goods (those that use the advances most) more than others.
6. T Absolute advantage is about who produces more, while comparative advantage is about who produces the good relatively inexpensively.
7. T See the section titled “The Circular Flow of Income” on page 50.
8. F A production possibilities frontier, not the circular flow diagram, illustrates opportunity cost in production.
9. T Refer to page 54 for a discussion of the U.S. Constitution.
10. F See the definition of opportunity cost on page 39 of the textbook.
11. T See a discussion of similar companies, such as YouTube and MySpace, on page 55 in the textbook.
12. F Donations to other charities were reduced as people donated to the tsunami relief effort. See Making the Connection “Trade-offs: Hurricane Katrina, Tsunami Relief, and Charitable Giving” on page 41.
13. T The countries that are mentioned in this problem are in the list of examples of free markets in the textbook.
14. F The Chapter Opener discusses the BMW plant in Spartanburg, South Carolina.
15. T The change in the opportunity cost per each additional unit of the good being produced; i.e. the marginal opportunity cost; is constant along a linear *PPF*.