

CHAPTER 2

PRODUCTION POSSIBILITIES AND OPPORTUNITY COSTS



Chapter in a Nutshell

This chapter considers how **productive resources** — **labor, capital, land, and entrepreneurship** — are combined to produce goods. A model is developed to represent an economy's **production possibilities**. Our model of production possibilities highlights the need for societies to make choices in the face of scarcity — a concept that was stressed in the first chapter. There is an **opportunity cost** associated with any choice that is made. For example, in order for an economy to produce more of one good, it will be forced to sacrifice units of production of other goods. Moreover, we will find that shifting resources from the production of one good to another involves increasing sacrifices of the first good in order to generate equal increases in the second good. This phenomenon is called **the law of increasing costs**.

Economic growth occurs in an economy where the supplies of productive resources increase over time. Economic growth is an expansion of an economy's production possibilities. Another source of economic growth is ideas that take the form of **new applied technologies** called **innovations**. Innovation allows a given quantity of resources to produce a larger output. **Division of labor and specialization** is yet another way that an economy can experience economic growth. As people specialize in specific tasks, they are able to produce more than if they spread their talents and energies over many unspecialized tasks. **Division of labor and specialization** occur at the international level. We will learn that economies specialize at the international level in activities for which they have an **absolute advantage** — that is, the country can produce a good with fewer resources than can other countries. Specialization also occurs according to **comparative advantage**. A country has a comparative advantage if it can produce a good at a lower opportunity cost than other countries.

After studying this chapter, you should be able to:

- Name the **factors of production**.
- Describe an economy's **production possibilities**.
- Distinguish between **capital goods** and **consumption goods**.
- Define **opportunity cost**.
- Explain the **law of increasing costs**.
- Show how new **technology** and **innovation** lead to **economic growth**.
- Explain how **specialization and division of labor** increases productivity.
- Account for international specialization according to **absolute and comparative advantage**.



Concept Check — See how you do on these multiple-choice questions.

Does the opportunity cost of producing a good change as more is produced given the law of increasing cost?

1. An economy that experiences **the law of increasing costs** and shifts resources from automobile production to computer production in order to increase computer output by fixed increments must
 - a. be inefficient
 - b. be shrinking
 - c. be growing
 - d. operate beyond its production possibilities curve in the impossibilities region
 - e. give up increasing amounts of automobiles

Recall that an innovation is the introduction of a new applied technology to production that reduces the severity of scarcity.

2. An **innovation** is a change in the way that a good is produced such that
 - a. economic growth decreases
 - b. the amount of labor used increases
 - c. the same amount of resources can produce a larger output
 - d. computers are used in production
 - e. scarcity is abolished

Economic growth is a shift to the right in the production possibilities curve. Which of the possible answers listed below would not result in a shift in the production possibilities curve?

3. All of the following except _____ will result in **economic growth**.
 - a. growth in the labor force
 - b. growth in the capital stock
 - c. improvements in technology
 - d. an increase in entrepreneurship
 - e. an increase in the unemployment rate

A poor economy must necessarily devote most of its resources to the production of consumption goods just to provide for subsistence.

4. **Capital accumulation** is limited in poor countries because
 - a. their citizens don't want to work
 - b. most of their resources must be devoted to production for subsistence
 - c. of the law of increasing costs
 - d. people in these countries are quite satisfied to be poor
 - e. wars in these countries have wiped out the advanced technology that used to exist

For this question, think about what is given up in going to see the movie?

5. The **opportunity cost** of going to see a movie is equal to
 - a. the cost of the ticket
 - b. the time lost while watching the show
 - c. the value of the next best possible action
 - d. five points that you missed on the economics quiz you could have studied for
 - e. the pleasure you could have enjoyed watching TV instead

Am I on the Right Track?



If your answers to these questions were **e**, **c**, **e**, **b**, and **c**, then you are on the right track. Perhaps the best study hint for mastering this chapter (and one that applies to all subsequent chapters) is to learn the jargon used by economists. Economists use language that appears rather ordinary, but the meanings they attach to these words are often quite different from the ordinary meanings usually associated with them. So, learn the concepts of opportunity cost, law of increasing cost, technological change, innovation, labor specialization, among others. Progress will be much easier if we all agree on definitions to specific terms. The key terms quiz that follows should help.

Key Terms Quiz — Match the term on the left with the definition in the column on the right.

- | | | |
|-----------------------------|-------|---|
| 1. factors of production | _____ | a. division of labor into specialized activities |
| 2. labor | _____ | b. manufactured goods used to make other goods and services |
| 3. capital | _____ | c. combinations of goods and services that can be produced |
| 4. human capital | _____ | d. the opportunity cost of producing a good increases as its output rises |
| 5. land | _____ | e. an idea that becomes an applied technology |
| 6. entrepreneur | _____ | f. producing a good with fewer resources than another producer |
| 7. production possibilities | _____ | g. resources that are less than fully utilized |
| 8. opportunity cost | _____ | h. producing a good at a lower opportunity cost than another producer |
| 9. law of increasing costs | _____ | i. physical and intellectual effort by people in the production process |
| 10. innovation | _____ | j. the quantity of goods that must be given up to obtain a good |
| 11. underemployed resources | _____ | k. land, labor, capital, and entrepreneurship |
| 12. economic efficiency | _____ | l. the knowledge and skills acquired by labor |
| 13. labor specialization | _____ | m. the maximum possible output with resources fully employed |
| 14. absolute advantage | _____ | n. a natural-state resource such as real estate |
| 15. comparative advantage | _____ | o. a person willing to assume the risks of a business |

Graphing Tutorial

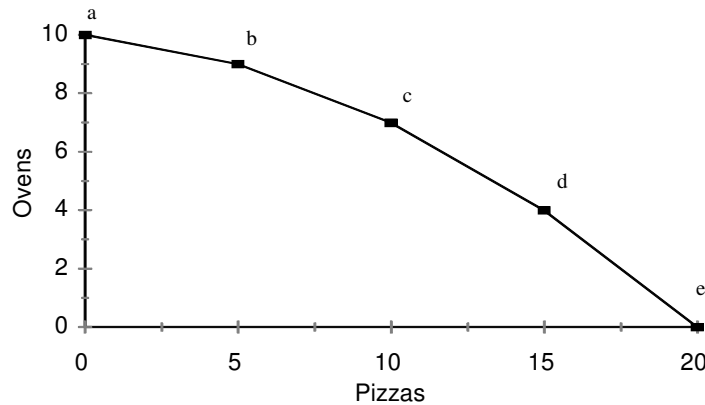
From a graphing perspective, this chapter is fairly straightforward. There is really only one type of graph presented in the chapter — the production possibilities curve (or frontier). The production possibilities curve is drawn bowed-out from the origin. The bowed-out shape of the curve reflects the law of increasing costs. However, the law of increasing costs is just one of many economic principles that can be illustrated with a production possibilities curve. The example presented below will help you appreciate the variety of applications for the production possibilities model.

Suppose an economy can produce pizzas or ovens in the combinations shown in the table below.

Pizzas	Ovens
0	10
5	9
10	7
15	4
20	0

This information is presented as a graph on the following page.

Production Possibilities Frontier for Pizza and Ovens



Note how the production possibilities frontier is bowed-out from the origin. Clearly, the law of increasing costs is at work in this case. Looking at the graph, let's start with 10 ovens and no pizza, at point **a**. To produce the first 5 pizzas, resources are shifted from oven making to pizza making. One oven is sacrificed. We move from the vertical intercept at 0 pizzas and 10 ovens toward the right on the curve to point **b** at 5 pizzas and 9 ovens. But look at what happens as we increase pizza production again. Resources must be shifted out of oven production, and we give up more ovens for each additional batch of 5 pizzas. Increasing costs show up as consecutive sacrifices of 2, 3, then 4 ovens as we increase pizza output from 5 to 20, finally ending up at point **e**.

The production possibilities table and curve assume full employment. Suppose this economy was producing only 10 pizzas and 4 ovens. Find this point on the graph. It lies inside the production possibilities frontier, indicating that resources are either unemployed or underemployed. Find the point represented by 15 pizzas and 8 ovens. This point lies outside the curve in what is termed the impossibilities region of the economy. Over time, with increases in the supplies of resources, new innovations, and greater labor specialization, we can expect the production possibilities for this economy to expand. The values shown in the table for pizza and oven output will increase, and the curve will shift to the right. This shift represents economic growth.

The questions and problems that follow will provide you with ample opportunity to develop your skills interpreting and drawing production possibilities frontiers.

True-False Questions — If a statement is false, explain why.

1. Factors of production include consumption goods. (T/F)
2. Slavery is a particular type of labor. (T/F)
3. When my hired housekeeper vacuums my home, he is performing labor. (T/F)
4. Human capital and labor are identical. (T/F)

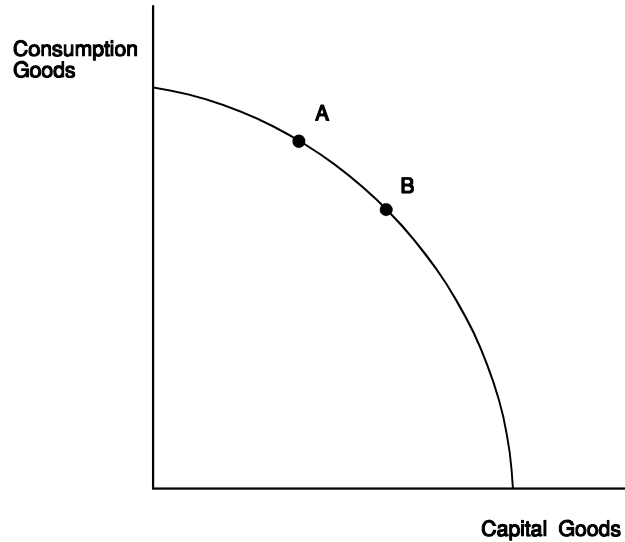


5. The personal computer that my son uses to play games on is a capital good. (T/F)
6. An entrepreneur is a person who assumes the risks associated with undertaking a business venture. (T/F)
7. The opportunity cost of a bushel of wheat is the money that must be sacrificed in order to produce it. (T/F)
8. An economy that operates on its production possibilities curve is efficient. (T/F)
9. The production possibilities for an economy expand as the supplies of factors of production increase. (T/F)
10. An economy that is growing will display outward shifts in its production possibilities curve. (T/F)
11. A pair of countries where one has an absolute advantage over the other in all areas of production will find it impossible to benefit from trade. (T/F)
12. The richer the economy, the more easily it can grow because the opportunity cost of shifting resources to capital goods becomes less painful. (T/F)
13. An economy that has underemployed resources can still operate on its production possibilities curve. (T/F)
14. If Japan can produce more automobiles and more computers than the United States using the same amount of resources, then Japan has an absolute advantage in both activities. (T/F)
15. If the opportunity cost of producing one car in Japan is 10 computers and the opportunity cost of producing one car in the United States is 5 computers, then the United States has a comparative advantage in computer production. (T/F)

Multiple-Choice Questions

1. Lumber, used in the construction of a farmer's barn, is considered
 - a. a consumption good because the farmer will use the barn
 - b. entrepreneurship if the farmer is an independent operator
 - c. capital because it is a good used to make other goods
 - d. human capital because it contains labor that made the lumber from the tree
 - e. neither a consumption good nor a factor of production because it is raw material

2. Points A and B on the production possibilities curve shown below represent combinations of consumption goods and capital goods produced in country A and country B, respectively. These positions suggest that in the future
- country A will grow faster than country B
 - country B will grow faster than country A
 - they will grow at the same rate because they are on the same curve
 - neither will grow because both are producing fewer capital goods than consumption goods
 - both countries will have unemployed resources



3. The production possibilities model applies
- only to economies that produce simple goods like the Crusoe economy described in the text
 - to economies without labor specialization
 - to economies without division of labor
 - to economies whose factors of production are fully employed
 - universally to all economies regardless of their differences
4. If an economy experiences unemployment, it would show up as a point
- on the production possibilities curve but on one of the axes
 - outside the production possibilities curve
 - inside the production possibilities curve
 - on the production possibilities curve
 - on a production possibilities curve that is shifting to the right
5. Which of the following statements about the application of new technologies is **false**?
- an idea that eventually takes the form of newly applied technology is described as innovation
 - technological change can shift the production possibilities curve to the right
 - new technology reduces the severity of scarcity
 - our grandchildren will likely regard our technology as rather primitive
 - the application of new technology shifts the production possibilities curve inward because it creates unemployment

6. The law of increasing costs suggests all of the following **except** that
 - a. resources, such as labor and land, are not of equal quality or fertility
 - b. resources, such as labor and land, are of equal quality and fertility
 - c. switching from producing one good to another involves increasing sacrifices of the first good
 - d. the opportunity cost of producing a good is not constant along a bowed-out production possibilities curve
 - e. the opportunity cost of producing more of a good increases as resources are shifted away from producing other goods

7. To economists, the term "capital" refers exclusively to
 - a. goods used to produce other goods and services
 - b. money used to purchase capital in the form of stocks and bonds
 - c. savings accumulated by households to purchase capital
 - d. money used by an entrepreneur to purchase capital
 - e. real estate, forests, metals, and minerals

8. New bicycles that are maintained as inventory in a sporting goods store are
 - a. consumption goods
 - b. capital goods
 - c. held at a high opportunity cost
 - d. capital goods if they are intended for traveling to and from a job
 - e. consumption goods if they are intended for recreation

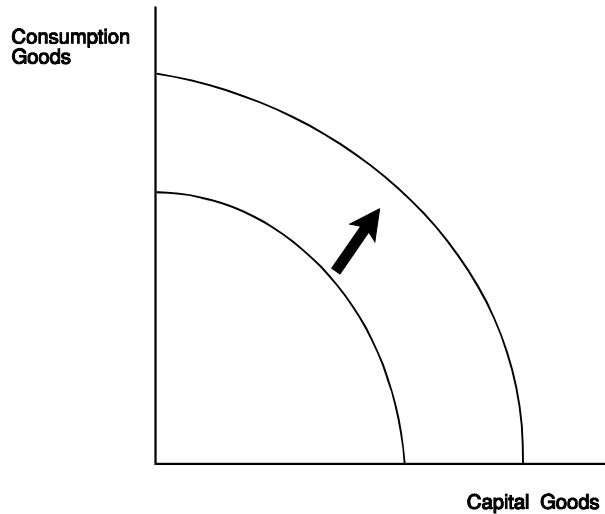
9. New ideas that are used in production as applied technologies are called
 - a. inventions
 - b. entrepreneurship
 - c. factors of production
 - d. economic efficiency
 - e. innovations

10. Capital accumulation (addition to capital) occurs in an economy when
 - a. more inputs are used in production
 - b. resources are shifted from the production of consumption goods to the production of capital goods
 - c. new technologies are adopted
 - d. workers work longer hours
 - e. the economy operates at full employment

11. One of the reasons that poor economies tend to stay poor is that
 - a. workers in these economies are not sufficiently motivated because their consumption goods are insufficient to satisfy their needs
 - b. their governments tend to shift resources from capital goods to consumption goods
 - c. most of their resources are devoted to consumption goods production so little capital accumulation occurs
 - d. they are exploited by the industrially advanced economies
 - e. they do not have a production possibilities curve

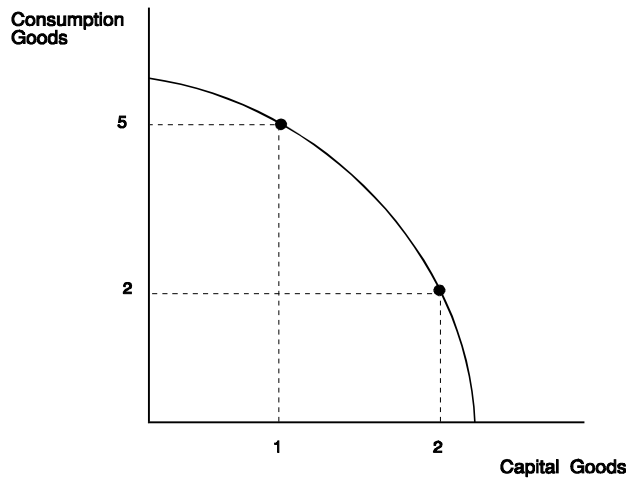
12. If an economy is operating along its production possibilities curve, then it is clear that
 - a. all factors of production are fully employed
 - b. poverty is eliminated
 - c. technological change is assured
 - d. some resources may still be underemployed
 - e. economic growth must slow down

13. The most likely explanation for the shift in the production possibilities curve shown below is
- a decrease in the supplies of some inputs
 - a decrease in the supplies of all inputs
 - the adoption by the government of a full employment policy
 - a shift from capital goods to consumer goods production
 - technological change which occurs in the production of both capital and consumption goods



14. An entrepreneur _____ manager of a firm, but assumes _____ for the success or failure of the firm.
- is the sole; no responsibility
 - may or may not be the sole; full responsibility
 - cannot be the sole; full responsibility
 - desires to be; full responsibility
 - may or may not be the sole; partial responsibility
15. Specialization and division of labor take place at the international level according to the
- law of increasing costs
 - principle of comparative advantage
 - principle of economic efficiency
 - rate of new innovation
 - universality of the production possibilities model
16. If an economy is operating inside its production possibilities curve, then it is possible to
- increase the output of one good but not the other
 - determine that the economy has a comparative advantage in one of the goods produced
 - experience the law of increasing costs by moving to the curve
 - determine that the economy has an absolute advantage in one of the goods produced
 - move to a point on the curve without any sacrifice of other goods

17. Although countries may experience devastating losses of human life and physical capital during a war, their postwar economies typically recover quickly because
- citizens are motivated by patriotism to rebuild quickly
 - the ideas on which production technologies are based are indestructible
 - other countries will typically come to the devastated country's aid
 - entrepreneurs usually find great investment opportunities right after a war
 - political leaders use great care in planning for recovery
18. Given the following production possibilities frontier, the opportunity cost of increasing capital goods production from one to two is
- five consumption goods
 - four consumption goods
 - three consumption goods
 - two consumption goods
 - one consumption good



Questions 19 and 20 are based on the data in the following table. In one day, Mexico can use all of its resources to produce either 100 bushels of corn or 200 pounds of avocados. Similarly, the United States can use all of its resources to produce either 80 bushels of corn or 80 pounds of avocados in one day.

Quantities of Corn and Avocados Produced in Mexico and the United States in One Day

	Corn (bushels)	Avocados(pounds)
Mexico	100	200
United States	80	80

19. Which country has an absolute advantage in what?
- Mexico in avocados; the United States in corn
 - Mexico in corn; the United States in avocados
 - Mexico in avocados and corn
 - the United States in avocados
 - the United States in corn

20. In the United States, the opportunity cost of one bushel of corn is _____ pound(s) of avocados while in Mexico the opportunity cost of one bushel of corn is _____ pound(s) of avocados so the United States has a comparative advantage in _____ production.
- one; two; corn
 - one; two; avocado
 - 80; 200; corn
 - 80; 200; avocado
 - 100; 200; corn

The following questions relate to the applied, theoretical, and historical perspectives in the text.

21. Steve is walking along 5th Avenue passing by a penny, a nickel, a dime, and a quarter along the way. He only bothers to bend down to pick up the quarter. We can infer that the opportunity cost to Steve of picking up a coin measured in monetary units is
- one cent
 - five cents
 - ten cents
 - greater than ten cents but less than 25 cents
 - at least 25 cents
22. For an economy that produces along its production possibilities curve, the opportunity cost of increasing the production of military goods is equal to the
- dollar amount by which the defense budget increases
 - cost of the war in which they will be used
 - nonmilitary goods sacrificed to produce the military goods
 - capital goods sacrificed to produce the military goods
 - consumer goods sacrificed to produce the military goods
23. Although the port city Rotterdam was destroyed by German bombs early in World War II, it was quickly rebuilt after the war so that the port could handle even greater volumes of cargo because the
- Germans spared most of the port facilities in their bombing campaign
 - Dutch are thrifty, hard-working people
 - British taught the Dutch how to build improved port facilities
 - knowledge about how to build a port was not destroyed and new capital was more productive
 - United Nations provided funds to rebuild the port with new technology

Fill in the Blanks

- The _____ of producing more capital goods is the amount of _____ sacrificed.
- As resources are shifted from producing one good to producing another, the opportunity cost of the second good _____, which illustrates the _____.
- Because a poor society must devote so many resources to the production of _____ goods, it is very difficult for it to produce _____ goods in order to encourage faster economic growth.
- If an economy operates inside its production possibilities frontier, it is an indication of _____ or _____ resources.
- To say that the United States produces computer software at lower opportunity cost than does Great Britain

suggests that the United States has a _____ in software production.

Discussion Questions



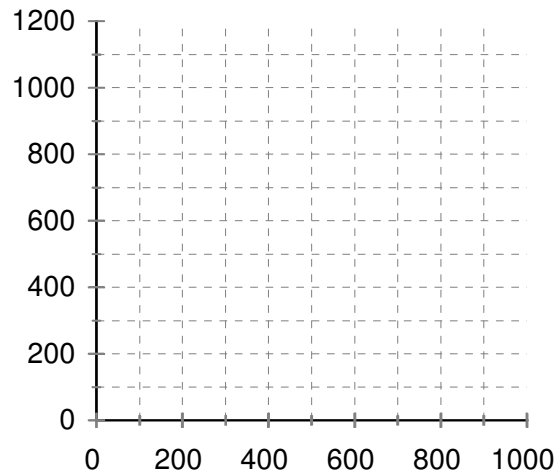
1. Does my son, who weeds the backyard because I insist, constitute labor? Does your answer change if my son and I agree that he will be paid \$0.25 per bucket of weeds pulled? Explain.
2. What is the opportunity cost of your college education? How does the opportunity cost change if you had been offered a job paying \$75,000 a year in a field you love at the beginning of this academic year? Would you still be in college this year?
3. Why do entrepreneurs hire specialists, sometimes at very high wage rates?
4. Carefully distinguish between the terms absolute advantage and comparative advantage.
5. How does specialization according to comparative advantage affect labor productivity?

Problems

1. The figures in the table below represent the production possibilities for a country that produces capital goods and consumption goods.

Capital Goods	Consumption Goods
1,000	0
800	400
600	750
400	1,000
200	1,150
0	1,200

- a. Sketch a graph with capital goods on the horizontal axis and consumption goods on the vertical axis and draw the production possibilities curve that corresponds to these data.



- b. Does the graph you have drawn exhibit the law of increasing costs? How do you know? Use the concept of opportunity cost and the data provided to explain the law of increasing cost.

2. The following table shows the amounts of apples or cheese that can be produced in Washington and Wisconsin in one day.

	Apples(bushels)	Cheese(pounds)
Washington	400	100
Wisconsin	400	200

If these two states specialize, what should each one produce? Why? Explain carefully using the concepts absolute and comparative advantage.

3. Return to the graphing tutorial presented on pages 19-20 above. Suppose that the resources available in the economy were to double, that is, twice as much labor, capital, land, and entrepreneurship. How would the economy's production possibilities change? Construct a table to show the new production possibilities and draw a graph to show how the production possibilities curve changes.

4. The following table shows the **labor time in hours** required to produce skis and chocolate in Switzerland and the United States.

	United States	Switzerland
One pair of skis	10	8
One pound of chocolates	2	1

- a. Given this information, which country has an absolute advantage in skis? In chocolate? Explain.

(Hint: Be careful because the units in this table are in hours of time required to produce each good, not in physical units.)

- b. Which country has a comparative advantage in chocolate? In skis? Explain.

Everyday Applications

1. What was the opportunity cost of your working through these study guide exercises? Was it worth it? How will you know? Knowing the concept of opportunity cost won't necessarily make you a better decision maker, but it should change the way you evaluate the decisions you make.
2. North Korea is a desperately poor country right now. Will North Korea stay poor because it currently is poor? What would happen if North Korea were to allocate more of its resources to the production of capital goods rather than consumption goods?



Economics Online

Output tables were used in this chapter to illustrate the principle of comparative advantage. It is also possible to see comparative advantage in real trade statistics. For example, take a look at U.S. trade with Japan in the year 2000 at <http://www.census.gov/foreign-trade/balance/c5880.html>. In which categories does the U.S. seem to have a comparative advantage? In which areas does Japan seem to have a comparative advantage? (Hint: if a country has a comparative advantage in a sector, what would be true of its exports versus imports?) Take a look at some years prior to 2000. Is comparative advantage static or might it be changing over time?

Answers to Questions

Key Terms Quiz

- | | | |
|-------|-------|-------|
| a. 13 | f. 14 | k. 1 |
| b. 3 | g. 11 | l. 4 |
| c. 7 | h. 15 | m. 12 |
| d. 9 | i. 2 | n. 5 |
| e. 10 | j. 8 | o. 6 |

True-False Questions

1. False. Consumer goods are some of the final goods and services produced by factors of production.
2. False. Labor requires a voluntary agreement between an employer and employee. Slavery is involuntary.
3. True
4. False. Labor is the physical and mental exertion of people engaged in production. Human capital is the knowledge and skills acquired by labor usually through education and training.
5. False. If my son is playing games on the computer it is a consumption good.

6. True
7. False. The opportunity cost is the quantity of other goods that must be given up to produce the bushel of wheat.
8. True
9. True
10. True
11. False. Trade can benefit both countries if comparative advantages exist.
12. True
13. False. Full employment of all resources in the economy is a requirement for its being on the curve.
14. True
15. False. The United States would have the comparative advantage in car production because the opportunity cost of producing cars in the United States is less than in Japan (5 computers compared to 10 computers).

Multiple-Choice Questions

- | | | | | |
|------|-------|-------|-------|-------|
| 1. c | 6. b | 11. c | 16. e | 21. d |
| 2. b | 7. a | 12. a | 17. b | 22. c |
| 3. e | 8. b | 13. e | 18. c | 23. d |
| 4. c | 9. e | 14. b | 19. c | |
| 5. e | 10. b | 15. b | 20. a | |

Fill in the Blanks

1. opportunity cost; consumption goods
2. increases; law of increasing costs
3. consumption; capital
4. underemployed or unemployed
5. comparative advantage

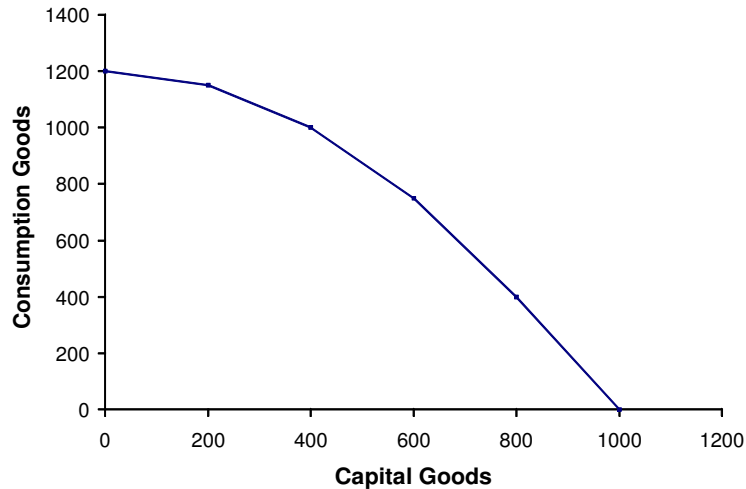
Discussion Questions

1. My son will tell you that the only way he will weed the backyard without pay is if I coerce him. This is not labor. However, if we agree on a wage, then the work is labor.
2. The opportunity cost of going to college is the money you give up not working during the time you are in college. If the described job offer is better than your next best alternative now, then your opportunity cost has risen, and you are less likely to go to college this year.
3. Entrepreneurs hire specialists because these people are very productive. That is, a specialist can produce more in a given period of time than a nonspecialized worker. Because specialists produce more, they are paid a higher wage.
4. An absolute advantage exists if one country can produce more of a good than another country with the same resources. A country has a comparative advantage in the production of a good if it can produce the good at a lower opportunity cost than can another country. That is, the country with the comparative advantage gives up less to produce the good than does the other country.
5. Specialization according to comparative advantage will increase labor productivity because countries and their labor forces will be specializing in activities that they perform at relatively lower opportunity costs. For example, a country that begins to specialize according to its comparative advantage shifts its productive resources into producing goods that have a lower opportunity cost to produce. If the country gives up less to produce these goods, it necessarily ends up with more output from its workers. Hence, labor productivity is

higher.

Problems

1. a. Your graph should look like the one shown below.



- b. This graph does exhibit the law of increasing costs because it is bowed-out from the origin. Furthermore, for each 200-unit increase in capital goods production, the sacrifice in consumption goods rises. These sacrifices, or opportunity costs, are 50, 150, 250, 350, and 400 for each additional 200 units of capital goods produced.
2. Washington will specialize in apple production because the opportunity cost of one bushel of apples is one-fourth pound of cheese. Wisconsin will specialize in cheese production because the opportunity cost of producing a pound of cheese is two bushels of apples whereas the opportunity cost of producing a pound of cheese in Washington is four bushels of apples. Wisconsin has an absolute advantage in cheese production while Washington has a comparative advantage in apple production.
3. All the numbers in the table would double and the production possibilities curve would shift out to the right so that all the values along the curve double too.
4. a. Switzerland has an absolute advantage in both activities because it does both in less time than does the United States.
- b. The opportunity cost of one pound of chocolates in the United States is one-fifth pair of skis. In the two hours it takes to produce one pound of chocolate in the United States, one-fifth pair of skis is given up. By similar reasoning, the opportunity cost of one pound of chocolates in Switzerland is one-eighth pair of skis. It takes one hour to produce a pound of chocolate in Switzerland and eight hours to produce a pair of skis. Therefore, Switzerland has a comparative advantage in chocolate production because the opportunity cost of producing chocolate is lower there.

Homework Questions

True-False Questions — If a statement is false, explain why.

1. Human capital is the knowledge and skills acquired by labor. (T/F)
2. Poor countries are poor because they cannot produce capital goods and they cannot produce capital goods because they are poor. (T/F)
3. An economy is efficient when it produces the maximum possible output with resources fully employed. (T/F)
4. If Brazil can produce steel at lower opportunity cost than can the United States, then Brazil has a comparative advantage in steel production. (T/F)
5. If an economy enjoys an increase in all of the factors of production, then the production possibilities curve will shift to the right. (T/F)

Multiple-Choice Questions

1. The factors of production – land, labor, capital, and entrepreneurship, are paid, respectively,
 - a. rent, wages, interest, profit
 - b. wages, rent, interest, profit
 - c. rent, interest, profit, wages
 - d. interest, profit, wages, rent
 - e. profit, wages, rent, interest
2. An example of an innovation is
 - a. doubling the size of a factory with the same type of equipment
 - b. shifting along the production possibilities curve to produce more capital goods
 - c. increasing the outlay for elementary school education
 - d. the discovery and implementation of gene therapy to cure diabetes
 - e. lending to a firm so that it may establish a new retail outlet store
2. Suppose that the United States begins to shift resources from producing coal to producing windmills. We would expect that the opportunity cost of more windmills measured as amounts of coal sacrificed will
 - a. be constant as more windmills are produced
 - b. decrease as more windmills are produced
 - c. increase as more windmills are produced
 - d. vary with the amount of labor used as more windmills are produced
 - e. vary with the amount of capital used as more windmills are produced
3. The law of increasing costs is evident in the production possibilities curve because of
 - a. its bowed-out shape
 - b. its negative slope
 - c. gradual shift to the right

