APMic Unit 1 Study Guide Answers

Part 1

Anything Worth Doing Is Not Necessarily Worth Doing Well

Student Alert: **Should you do all you can to earn a perfect grade of 100 on your next economics exam?**

Bartlett's Familiar Quotations contains wisdom from writers separated by more than a millennium. Whose wisdom best fits today's world?

> ***Always take the short cut; and that is the rational one. Therefore say and do everything according to soundest reason.***
>
> *Meditations iv.51*
> Marcus Aurelius
> A.D. 120 to 181

> ***Whatever is worth doing at all is worth doing well.***
>
> Philip Dormer Stanhope
> Earl of Chesterfield
> 1694 to 1773

Between these two extremes, one discovers the economic way of thinking. We know that productive resources are limited, so we cannot have everything we want. We must economize by choosing among alternatives.

We may want the very best product available, but we settle on a product with fewer features or less durability because the extra benefit of the product we would most like to have is simply not worth the extra cost. Resources that aren't devoted to making a good product perfect can be allocated to making other products.

Few choices we make in life are all-or-nothing decisions. We decide on the number of assigned chapters to read today based on alternative uses of our time. We frequently adjust the number of hours we study for each subject because of tests and nonschool uses of our day. Epidemic doses of "senioritis"—severely curtailing work for grades after college-acceptance letters are received—may suggest that the majority of students agree with Marcus Aurelius rather than the Earl of Chesterfield. Even the most severe victims of senioritis may admit that they are incurring a very different cost: the lost opportunities to learn the cultural and scientific knowledge that will be required in college.

An excellent academic record in high school expands the array of college choices for the graduating high school senior. "A" grades are preferred to "C" grades for reasons that don't warrant an explanation: the extra benefits of the explanation are not worth the extra costs of reading it.

This comparison of additional, or marginal, benefits and costs applies to production decisions, too. Of course, auto companies can make cars that work for a quarter century, but would the extra manufacturing cost be worthwhile over the product lifetime? Technical advances frequently lead to superior products at lower cost. Because of blindingly rapid changes in computer technology, the concept of an "old" computer is measured in months; so building a computer case that lasts for 50 years would be wasteful. Can you suggest services or products that are satisfactory, but not superior?

Thinking about the future requires that we acknowledge what we have and then make incremental changes so the marginal benefits of the changes exceed the marginal costs. Mechanical equipment in an

aircraft must meet higher quality standards than the same product in a car. If the alternator fails in a car, one typically has enough time to pull off the road before the car stops. In an airplane, safe landing options are fewer than those available to the motorist. Both quality decisions are correct because the added benefits from avoiding failure in a plane greatly exceed the marginal benefits from avoiding mechanical failure in a car.

1. After reading in *Bartlett's Familiar Quotations* that "knowledge is power," a student decides to be as knowledgeable as possible by devoting the next 20 years, without interruption, to college. From the hypothetical data below, would you advise this person to reconsider a career as a professional student? Answer the questions that follow.

Table 1-11.1

Degree Earned and Expected Lifetime Earnings and Costs

Highest degree earned	Expected lifetime earnings (total benefit) by degree	Marginal benefit of additional degree	Expected lifetime costs (total cost) by degree	Marginal cost of additional degree
High school	$600,000	+$600,000	$0	+$0
Associate	$1,200,000	***+$600,000***	$200,000	***+$200,000***
Bachelor's	$1,700,000	***+$500,000***	$500,000	+$300,000
Master's	$2,100,000	+$400,000	$900,000	***+$400,000***
Doctorate	$2,400,000	***+$300,000***	$2,400,000	***+$1,500,000***

(A) Complete Table 1-11.1 with the missing values of the marginal benefit and marginal cost of earning an additional degree.

(B) Would a master's degree and a doctorate degree increase the human capital of the student? (***Yes*** / *No*)

(C) In the process of building knowledge, would the doctorate degree be the best example of doing a job well? (***Yes*** / *No*)

(D) Assuming that inflation and interest rates have been taken into account in these data, what is the optimal degree for this person to earn?
Comparing the values of marginal benefit and marginal cost, the optimal degree for the person is the Master's degree. For this degree the marginal benefit equals the marginal cost. The marginal benefit of earning the doctorate degree is less than the marginal cost.

(E) Which criterion did you use to determine the optimal degree this person should obtain?
Total Benefit = Total Cost **/ *Marginal Benefit = Marginal Cost***

(F) Since inflation is already factored into the data, what is the most likely reason that the costs of a doctorate degree rise to such a high level?
A person seeking a doctorate degree already has acquired enough education to have high income earning skills. The opportunity cost of the additional time needed to earn the doctorate degree is the sacrifice of high earnings during this time.

2. Wrapping garbage neatly before taking it to the trash can, raking leaves on a windy day, hand-drying dishes after they have been run through a dishwasher's dry cycle, and similar tasks seem to push the credibility of any value in doing a job well. Give examples of jobs with highly diminishing marginal benefits.
Answers will vary. Ironing blue jeans and cleaning up every speck of dust are examples of such jobs.

3. Consider an electronic item that you have thought about buying. Do you always choose the highest-priced good? Explain your answer.
People frequently don't purchase the highest-priced goods because the marginal benefit of the highest quality is not worth the additional cost.

4. If you wanted to eliminate "senioritis," how would you change the college acceptance process and/or the incentives offered by high school instructors?
You could make college acceptance conditional on work during the entire senior year. This would raise the cost of senioritis and provide an incentive for seniors to study harder.

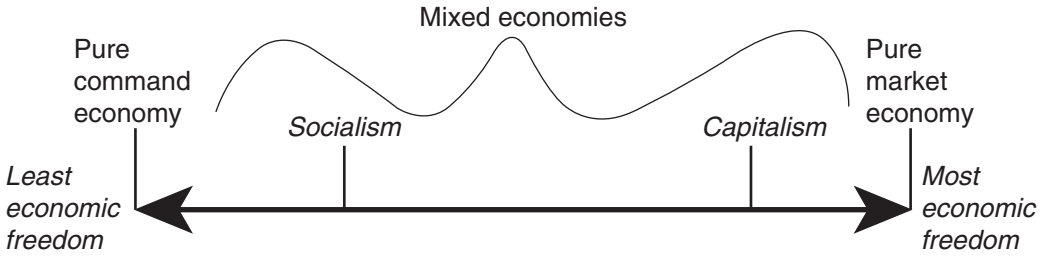
Part 2

Economic Systems

Read the following description of economic systems, answer the review questions, and then complete the table.

It's a fact: our needs and wants are always greater than the available resources necessary to satisfy us. We all face scarcity, which forces us to choose how best to use the limited resources that are available. Ultimately, society has to make three very important economic decisions: what do we produce, how do we produce, and for whom do we produce? To answer these three questions, a society develops an economic system, or organized way of answering the three questions. Because people do not all share the same values, beliefs, geographic circumstances, and climates, different societies have developed very different economic systems to deal with scarcity. Figure 1-10.1 shows a continuum of the economic systems that have been developed throughout history based on the amount of freedom individuals have to answer the three economic questions.

Figure 1-10.1
Economic Systems



In a pure command economy, all economic decisions are made by the government or even a single leader. Ancient Egypt under the pharaohs and present-day North Korea are close, if not perfect, examples of pure command economies. The leaders decide what is to be produced, how it is produced, and for whom it is produced. Private property is nonexistent in the pure command model, and only the needs of the government are addressed.

In a pure market economy, all economic decisions are left to the individuals in the society. These individuals, motivated by their own self-interest and their desire for private property, answer the three economic questions. To get what they need or want, individuals come together in markets and trade for mutual benefit.

Although pure market economies are nonexistent, something close to the pure market model called *capitalism* does exist. The United States and a number of other countries can be described as capitalistic economies. Capitalism is an example of a mixed economy. Mixed economies are the reality of today's world. In a mixed economy, both individuals and government answer the three basic economic questions. If most decisions and property are under the control of individuals in the society, then the system can be described as capitalistic. If most decisions and property are under state control, then the system can be described as socialist.

1. What three basic questions must all societies answer?
   The questions are:
   (1) What goods and services should be produced?
   (2) How should those goods and services be produced?
   (3) For whom are the goods and services produced?

2. Define economic system.
   An economic system is an organized way society answers the three basic economic questions.

3. What is a market?
   A market is where sellers and buyers of a good or service come together to trade.

4. Complete the following table:

	Pure command economy	Mixed economy	Pure market economy
Who answers the three basic economic questions?	***Government***	***Government and individuals***	***Individuals***
What degree of economic freedom exists for individuals?	***None***	***Some***	***Most***
Under which type of economic system would you prefer to live and why? Be prepared to discuss your answers with your classmates.	***Answers may vary.***	***Answers may vary.***	***Answers may vary.***

Part 3

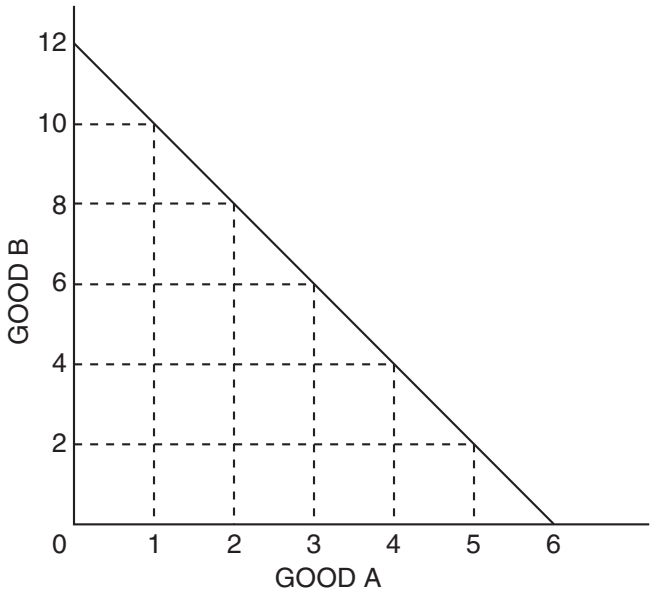
Scarcity, Opportunity Cost, and Production Possibilities Curves

The primary economic problem facing all individuals, families, businesses, and nations is the scarcity of resources: There simply are not enough resources to satisfy the unlimited wants for goods and services. Scarcity necessitates choice. Consuming or producing more of one thing means consuming or producing less of something else. The opportunity cost of using scarce resources for one thing instead of something else is often represented in graphical form as a *production possibilities curve* (PPC). A nation's PPC shows how many units of two goods or services the nation can produce in one year if it uses its resources fully and efficiently. This activity uses the PPC to illustrate how scarcity requires choices and the opportunity cost of those choices.

Part A: Basic Production Possibilities Curves

Figure 1-2.1 shows a basic PPC for the production of Goods A and B. Use Figure 1-2.1 to answer the questions that follow.

Figure 1-2.1
A Linear Production Possibilities Curve



1. Assume the economy represented by Figure 1-2.1 is presently producing 12 units of Good B and 0 units of Good A:

   (A) The opportunity cost of increasing production of Good A from 0 units to 1 unit is the loss of ___***2***___ unit(s) of Good B.

   (B) The opportunity cost of increasing production of Good A from 1 unit to 2 units is the loss of ___***2***___ unit(s) of Good B.

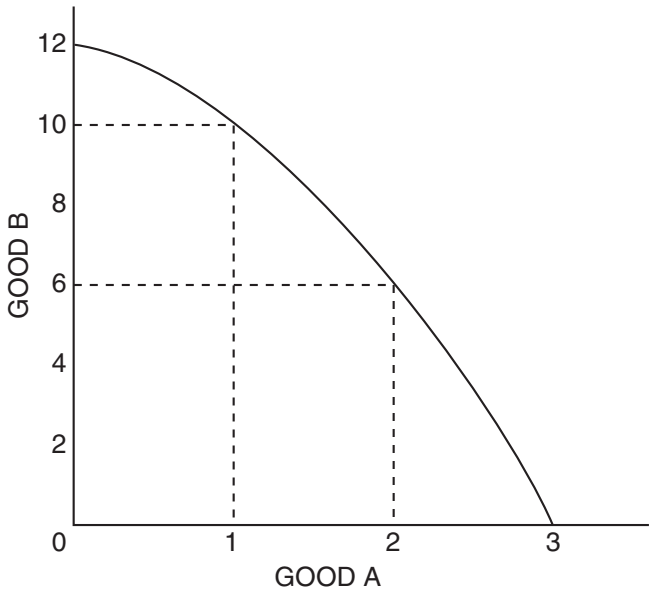
   (C) The opportunity cost of increasing production of Good A from 2 units to 3 units is the loss of ___***2***___ unit(s) of Good B.

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

Figure 1-2.2 contains a typical PPC often used by economists. This PPC is concave to the origin; it gets steeper as the country moves out along its horizontal axis. Use Figure 1-2.2 to answer the questions below it.

Figure 1-2.2

A Concave Production Possibilities Curve



2. If the economy represented in Figure 1-2.2 is presently producing 12 units of Good B and 0 units of Good A:

   (A) The opportunity cost of increasing production of Good A from 0 units to 1 unit is the loss of ___***2***___ unit(s) of Good B.

   (B) The opportunity cost of increasing production of Good A from 1 unit to 2 units is the loss of ___***4***___ unit(s) of Good B.

   (C) The opportunity cost of increasing production of Good A from 2 units to 3 units is the loss of ___***6***___ unit(s) of Good B.

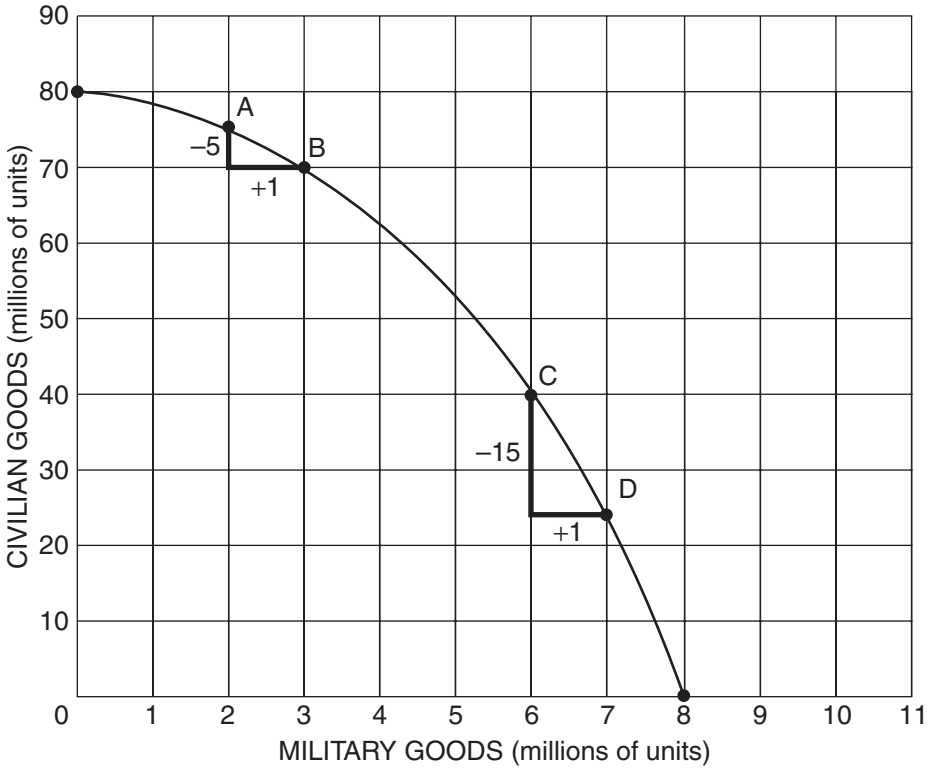
   (D) This is an example of (*constant* / ***increasing*** / *decreasing* / *zero*) opportunity cost per unit for Good A.

Part B: Understanding the Shape of a Concave PPC

The "law of increasing opportunity cost" explains why the typical PPC is concave to the origin (bowed outward). Figure 1-2.3 shows the PPC for the country of Costica. The country currently operates at point A and produces 75 million units of civilian goods and 2 million units of military goods. If the country decides to increase its military provision to 3 million units, it must give up only 5 million units in civilian goods because certain factories are easily converted from civilian production to military production. However, if Costica decides it must continue to increase its military production, the opportunity cost of doing so increases because now it is more difficult to convert other factories to military production. Resources are not equally well suited to the production of all goods. The opportunity cost of increasing military output from 6 million units to 7 million units (point C to point D) has increased to 15 million units in civilian goods. This increasing opportunity cost is reflected in the steeper slope of the PPC as the country produces more military goods and fewer civilian goods.

Figure 1-2.3

Showing the Law of Increasing Opportunity Cost



Part C: Drawing Various PPCs

Use the following axes to draw the type of curve that illustrates the label above each graph.

Figure 1-2.4

Production Possibilities Curve 1: Increasing Opportunity Cost per Unit of Good B

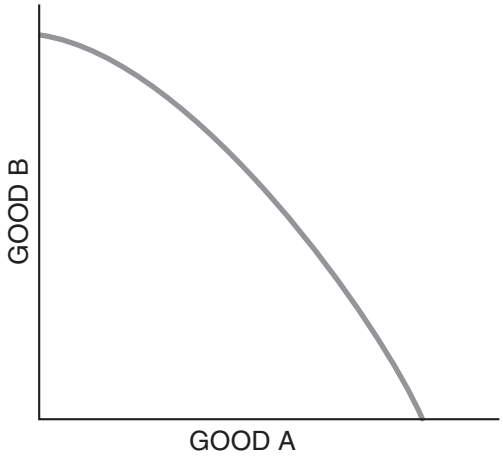


Figure 1-2.5

Production Possibilities Curve 2: Zero Opportunity Cost per Unit of Good B

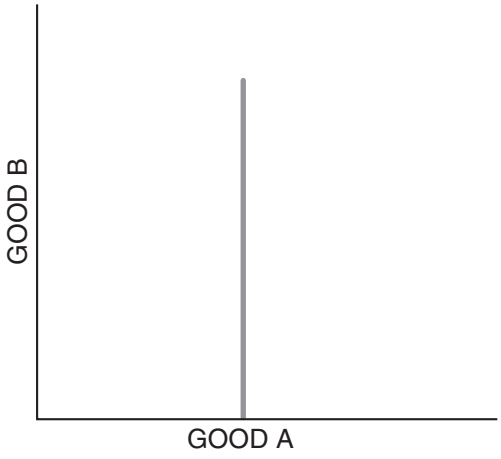
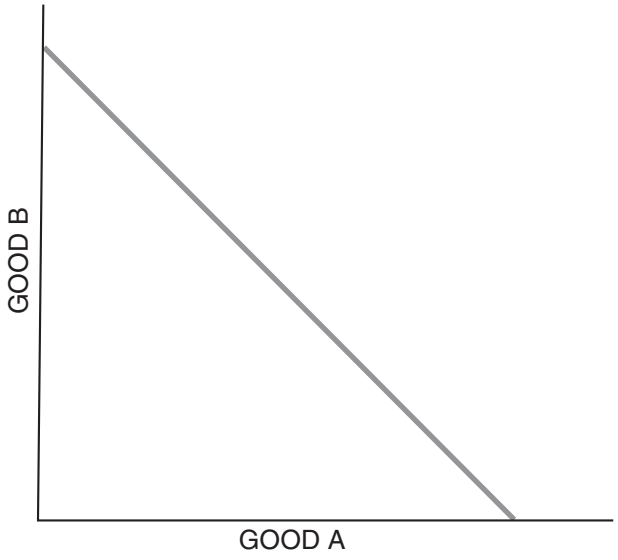


Figure 1-2.6

Production Possibilities Curve 3: Constant Opportunity Cost per Unit of Good B

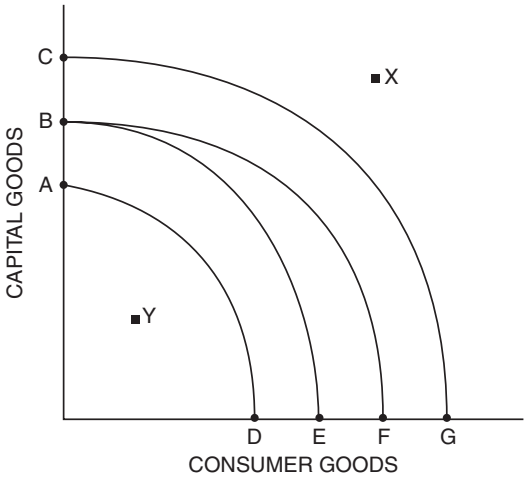


Part D: Economic Growth

Over time, most countries see an increase in their ability to produce goods and services. This "economic growth" is shown as an outward shift of the PPC and results from a variety of factors, including improved technology, better education, and the discovery of new resources. Use Figure 1-2.7 to answer the next five questions. Each question starts with Curve BE as a country's PPC.

Figure 1-2.7

Production Possibilities Curve: Capital Goods and Consumer Goods



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

4. Suppose a new government comes into power and forbids the use of automated machinery and modern production techniques in all industries. Which curve in the diagram would represent the new PPC? (Indicate the curve you choose with two letters.) ___***AD***___

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

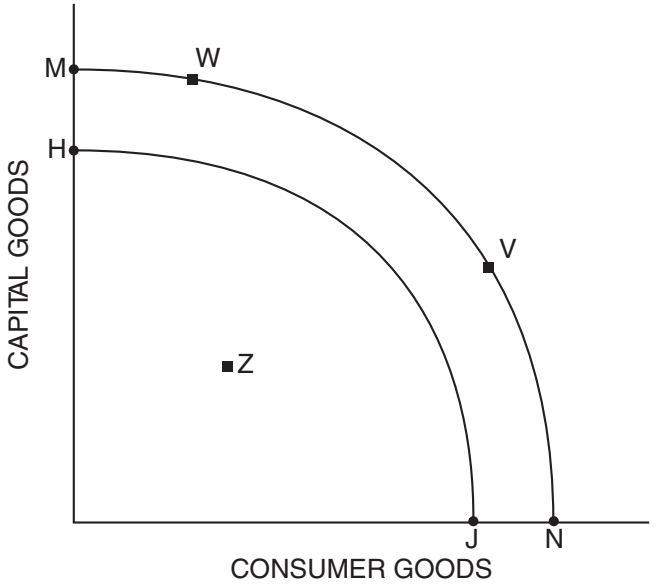
6. If BE represents a country's current PPC, what can you say about a point like X? (Write a brief statement.)
   It is impossible for this country to produce this combination of goods with its current resources and technology.

7. If BE represents a country's current PPC, what can you say about a point like Y? (Write a brief statement.)
   The country is producing beneath its potential because of unemployment and inefficient use of its resources.

Use Figure 1-2.8 to answer the next three questions.

Figure 1-2.8

Production Possibilities Curve: Economic Growth



8. What change could cause the PPC to shift from the original curve (HJ) to the new curve (MN)?
   There are several possible reasons for this economic growth, including new technology, discovery of new resources, improved education.

9. Under what conditions might an economy be operating at Point Z?
   Resources are not fully employed or they are used inefficiently.

10. Why might a government implement a policy to move the economy from Point V to Point W?
    The government might want to encourage the production of more capital goods as a means of stimulating economic growth. This would result in the PPC shifting out faster in the future.

Part 4

Determining Comparative Advantage

Voluntary trade between two individuals or two countries occurs if both parties feel that they will benefit. Producers have an incentive to make products for which they have a lower opportunity cost than other producers. When both producers specialize according to their *comparative advantage*, they increase the total amount of goods and services that are available for consumption. To determine who has a comparative advantage in producing a particular item, we need to calculate each producer's opportunity costs of creating the items. The way we calculate opportunity cost depends on how the productivity data are expressed.

There are two ways to measure productivity: the "input method" and the "output method." We can calculate the quantity of output produced from a given amount of inputs, or we can measure the amount of inputs necessary to create one unit of output. Examples of output are tons of wheat per acre, miles per gallon, words per minute, apples per tree, and televisions produced per hour. Examples of input are number of hours to do a job, number of gallons of paint to paint a house, and number of acres to feed a horse. We will work through an example that expresses productivity from the perspectives of an input measure and an output measure.

Part A: Two Approaches to Comparative Advantage

Student Alert: **In using these models to determine the lower opportunity costs from both an input and output viewpoint, you must pay attention to the format of the chart. It makes a difference!**

Input Method

The "input method" provides data on the amount of resources needed to produce one unit of output. Table 1-3.1 gives productivity information for Ted and Nancy.

Table 1-3.1
Productivity Data Using the Input Method

	Time required to produce one radio	Time required to produce one bushel of wheat
Ted	20 minutes	5 minutes
Nancy	30 minutes	15 minutes

Ted has an *absolute advantage* in the production of both radios and wheat because he uses fewer resources (time) to produce each item than does Nancy. Even though this might suggest that Ted cannot benefit from trade with Nancy, our examination of the opportunity costs of production will show that is not the case.

Table 1-3.2 shows the opportunity costs for each producer. To find the opportunity cost of producing one radio, the amount of resources it takes to produce a radio goes *above* the amount of resources that it takes to produce a bushel of wheat.

Table 1-3.2

Opportunity Cost of Producing Radios and Wheat

	Opportunity cost of producing one radio	Opportunity cost of producing one bushel of wheat
Ted	$1 \text{ radio} = \frac{20 \text{ minutes}}{5 \text{ minutes}} = 4 \text{ bushels}$	$1 \text{ wheat} = \frac{5 \text{ minutes}}{20 \text{ minutes}} = ¼ \text{ radio}$
Nancy	$1 \text{ radio} = \frac{30 \text{ minutes}}{15 \text{ minutes}} = 2 \text{ bushels}$	$1 \text{ wheat} = \frac{15 \text{ minutes}}{30 \text{ minutes}} = ½ \text{ radio}$

In the 20 minutes it takes Ted to produce one radio, he instead could have produced four bushels of wheat. Instead of producing one radio in 30 minutes, Nancy could have produced two bushels of wheat. The fact that Nancy has the lower opportunity cost of producing radios means she has the comparative advantage in radios.

In the five minutes he needs to produce one bushel of wheat, Ted could have made ¼ of a radio. Nancy's opportunity cost of producing one bushel of wheat is ½ of a radio. Because his sacrifice in producing one bushel of wheat is less than Nancy's, Ted has the comparative advantage in wheat production.

If Ted specializes in wheat production while Nancy specializes in radio production, their combined output of radios and wheat will be larger than it would be if each person produced both products.

Output Method

The "output method" gives data on the amount of output that can be produced with a given amount of an input. Now let's take this same set of productivity data and turn it into an output format. To do this, we ask how many units of an item the producers can create with a given amount of resources. Let's suppose that both producers have one hour to produce each product. Table 1-3.3 shows how many radios and how many bushels of wheat each producer can make in one hour. From this output viewpoint, you once again see that Ted has the absolute advantage in the production of both products. With the same amount of resources (one hour of labor), he can produce more radios and more wheat than Nancy.

Table 1-3.3

Productivity Data Using the Output Method

	Radios produced per hour	Wheat produced per hour
Ted	$\frac{60 \text{ minutes}}{20 \text{ minutes}} = 3 \text{ radios}$	$\frac{60 \text{ minutes}}{5 \text{ minutes}} = 12 \text{ bushels}$
Nancy	$\frac{60 \text{ minutes}}{30 \text{ minutes}} = 2 \text{ radios}$	$\frac{60 \text{ minutes}}{15 \text{ minutes}} = 4 \text{ bushels}$

But what about the opportunity cost to produce each item? Check out Table 1-3.4, which shows how to calculate each producer's opportunity cost of the two items. To find Ted's opportunity cost of producing one radio, the number of radios he can produce in one hour goes *under* the number of bushels of wheat he can produce in that same time frame.

Table 1-3.4

Opportunity Cost of Producing Radios and Wheat

	Opportunity cost of producing one radio	Opportunity cost of producing one bushel of wheat
Ted	3 radios = 1 hour = 12 bushels 1 radio = 12/3 = 4 bushels	12 bushels = 1 hour = 3 radios 1 bushel = 3/12 = ¼ radio
Nancy	2 radios = 1 hour = 4 bushels 1 radio = 4/2 = 2 bushels	4 bushels = 1 hour = 2 radios 1 bushel = 2/4 = ½ radio

Because Ted's cost per radio is four bushels of wheat, whereas Nancy's cost is only two bushels, we know Nancy has the comparative advantage in producing radios. Ted has the comparative advantage in wheat production since he has the lower opportunity cost of producing a bushel of wheat (¼ radio compared to Nancy's ½ radio). Does this sound familiar? This is the same result we reached using the input method.

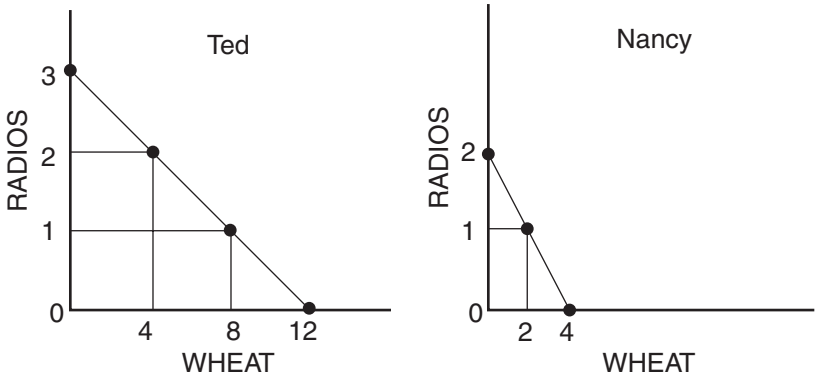
The differences in opportunity costs define the limits of a trade in which both parties will benefit. If Nancy specializes in radio production, she will accept no less than two bushels of wheat for one radio. Ted will pay no more than four bushels of wheat per radio. Thus, the "terms of trade" acceptable to both producers must lie in the range between two bushels for one radio and four bushels for one radio. For example, suppose they agree to trade one radio for three bushels of wheat. By producing and trading one radio to Ted, Nancy will have a net gain of one bushel. Her opportunity cost of producing the radio is two bushels and she receives three bushels in return for the radio. Because his opportunity cost of producing one bushel is ¼ radio, Ted's opportunity cost of producing the three bushels, which he trades to Nancy, is ¾ radio. Thus, the trade gives Ted a net gain of ¼ radio. Both producers gain by specializing according to their comparative advantage.

When it comes to producing wheat, Ted would have to receive at least ¼ of a radio in trade for a bushel of wheat. Nancy would require at least ½ of a radio before she would trade a bushel of wheat. The acceptable terms of trade would be found between ¼ radio and ½ radio per bushel of wheat.

The output data in Table 1-3.3 can be used to create production possibility frontiers for Ted and Nancy to show the combinations of radios and wheat each can produce in one hour of work. See Figure 1-3.1.

Figure 1-3.1

Production Possibilities Curves for Ted and Nancy



Part B: Comparative Advantage Exercises

For each of the following scenarios, answer the questions following the chart. The first problem is answered for you.

1. Anna and Barry can grow the following amounts of potatoes and cabbage with a week of labor.

	Potatoes per week	Cabbage per week
Anna	100 units	200 units
Barry	120 units	150 units

(A) Is this an example of an *input* problem or an *output* problem?
This is an output problem because it shows how much output each producer can create with a given amount of resources (one week of labor).

(B) What is the opportunity cost for each producer in making these products?

(1) Anna's opportunity cost of producing a unit of potatoes is ___*2*___ units of cabbage.

$$100\ P = 1\ \text{week} = 200\ C, \qquad \frac{100}{100}P = \frac{200}{100}C, \qquad 1\ P = 2\ C.$$

(2) Barry's opportunity cost of producing a unit of potatoes is ___*1.25*___ units of cabbage.

$$120\ P = 1\ \text{week} = 150\ C, \qquad \frac{120}{120}P = \frac{150}{120}C, \qquad 1\ P = 1\tfrac{1}{4}\ C = 1.25\ C.$$

(3) Anna's opportunity cost of producing a unit of cabbage is ___***0.5***___ units of potatoes.

$$200\ C = 1\ week = 100\ P, \qquad \frac{200}{200} C = \frac{100}{200} P, \qquad 1\ C = ½\ P = 0.5\ P.$$

(4) Barry's opportunity cost of producing a unit of cabbage is ___***0.8***___ units of potatoes.

$$150\ C = 1\ week = 120\ P, \qquad \frac{150}{150} C = \frac{120}{150} P, \qquad 1\ C = {}^{4}/_{5}\ P = 0.8\ P.$$

(C) Who has the comparative advantage in producing potatoes? ___***Barry***___
Barry has the comparative advantage in potatoes because his opportunity cost is lower than Anna's.

(D) Who has the comparative advantage in producing cabbage? ___***Anna***___
Anna has the comparative advantage in cabbage because her opportunity cost is lower than Barry's.

Note: In this example, each producer has the absolute advantage in producing one item: Barry in potatoes and Anna in cabbage. That might not be the case in the other examples.

2. Henry and John are fishermen who catch bass and catfish. This chart shows how many of each type of fish they can catch in one day.

	Bass	Catfish
Henry	4 bass	6 catfish
John	24 bass	12 catfish

(A) Is this an example of an *input* problem or an *output* problem?
It is an output problem because it shows the daily output of each fisherman.

(B) What is the opportunity cost for each person in catching these fish?

(1) Henry's opportunity cost of catching 1 bass is ___***1.5***___ catfish.
4 bass = 6 catfish;1 bass = 1.5 catfish

(2) John's opportunity cost of catching 1 bass is ___***0.5***___ catfish.
24 bass = 12 catfish;1 bass = 0.5 catfish

(3) Henry's opportunity cost of catching 1 catfish is ___***0.67***___ bass.
6 catfish = 4 bass; 1 catfish = 0.67 bass

(4) John's opportunity cost of catching 1 catfish is ___***2***___ bass.
12 catfish = 24 bass; 1 catfish = 2 bass

(C) Who has the comparative advantage in catching bass? ___***John***___

(D) Who has the comparative advantage in catching catfish? ___***Henry***___

3. This chart shows how many days it takes the ABC Corporation and the XYZ Corporation to produce one unit of cars and one unit of planes.

	Cars	Planes
ABC Corp.	8 days	10 days
XYZ Corp.	15 days	12 days

(A) Is this an example of an *input* problem or an *output* problem?
This is an input problem because you are told what resources (number of days) are needed to produce one unit of a good.

(B) What is the opportunity cost for each corporation in producing these goods?

(1) ABC's opportunity cost of producing a unit of cars is ___***0.8***___ units of planes.
1 car = 8 days = 0.8 planes

(2) XYZ's opportunity cost of producing a unit of cars is ___***1.25***___ units of planes.
1 car = 15 days = 1.25 planes

(3) ABC's opportunity cost of producing a unit of planes is ___***1.25***___ units of cars.
1 plane = 10 days = 1.25 cars

(4) XYZ's opportunity cost of producing a unit of planes is ___***0.8***___ units of cars.
1 plane = 12 days = 0.8 cars

(C) Who has the comparative advantage in producing cars? ___***ABC Corp.***___

(D) Who has the comparative advantage in producing planes? ___***XYZ Corp.***___

4. Here are the numbers of acres needed in India and China produce 100 bushels of corn or 100 bushels of rice each month.

	India	China
Corn	9 acres	8 acres
Rice	3 acres	2 acres

(A) Is this an example of an *input* problem or an *output* problem?
This is an input problem because you are told what resources (number of acres) are needed to produce a given amount of a good.

(B) What is the opportunity cost for each country in producing these goods?

(1) India's opportunity cost of growing 100 bushels of corn is ___***300***___ bushels of rice.
100 bushels of corn = 9 acres = 300 bushels of rice

(2) China's opportunity cost of growing 100 bushels of corn is ___***400***___ bushels of rice.
100 bushels of corn = 8 acres = 400 bushels of rice

(3) India's opportunity cost of growing 100 bushels of rice is ___***33.3***___ bushels of corn.
100 bushels of rice = 3 acres = 33.3 bushels of corn

(4) China's opportunity cost of growing 100 bushels of rice is ___***25***___ bushels of corn.
100 bushels of rice = 2 acres = 25 bushels of corn

(C) Who has the comparative advantage in growing corn? ___***India***___

(D) Who has the comparative advantage in growing rice? ___***China***___

5. This chart shows how many cans of olives and bottles of olive oil can be produced in Zaire and Colombia from one ton of olives.

	Zaire	Colombia
Olives	60 cans	24 cans
Olive oil	10 bottles	8 bottles

(A) Is this an example of an *input* problem or an *output* problem?
This is an output problem because the chart shows how much output can be produced from a given amount of resources.

(B) What is the opportunity cost for each country in producing these goods?

(1) Zaire's opportunity cost of producing 1 can of olives is ___***1/6***___ bottles of olive oil.
60 cans = 10 bottles; 1 can = 1/6 bottles

(2) Colombia's opportunity cost of producing 1 can of olives is ___***1/3***___ bottles of olive oil.
24 cans = 8 bottles; 1 can = 1/3 bottles

(3) Zaire's opportunity cost of producing 1 bottle of olive oil is ___***6***___ cans of olives.
10 bottles = 60 cans; 1 bottle = 6 cans

(4) Colombia's opportunity cost of producing 1 bottle of olive oil is ___***3***___ cans of olives.
8 bottles = 24 cans; 1 bottle = 3 cans

(C) Who has the comparative advantage in producing olives? ___***Zaire***___

(D) Who has the comparative advantage in producing olive oil? ___***Colombia***___

6. Here are the numbers of hours needed in Redland and Blueland to produce a unit of televisions and a unit of computers.

	Televisions	Computers
Redland	18 hours	6 hours
Blueland	16 hours	4 hours

(A) Is this an example of an *input* problem or an *output* problem?
This is an input problem because it states the amount of resources (hours of labor) needed to produce a unit of a good.

(B) What is the opportunity cost for each country in producing these goods?

(1) Redland's opportunity cost of producing 1 unit of televisions is ___***3***___ units of computers.
1 television = 18 hours = 3 computers

(2) Blueland's opportunity cost of producing 1 unit of televisions is ___***4***___ units of computers.
1 television = 16 hours = 4 computers

(3) Redland's opportunity cost of producing 1 unit of computers is ___***1/3***___ units of televisions.
1 computer = 6 hours = 1/3 television

(4) Blueland's opportunity cost of producing 1 unit of computers is ___***1/4***___ units of televisions.
1 computer = 4 hours = 1/4 television

(C) Who has the comparative advantage in producing televisions? ___***Redland***___

(D) Who has the comparative advantage in producing computers? ___***Blueland***___