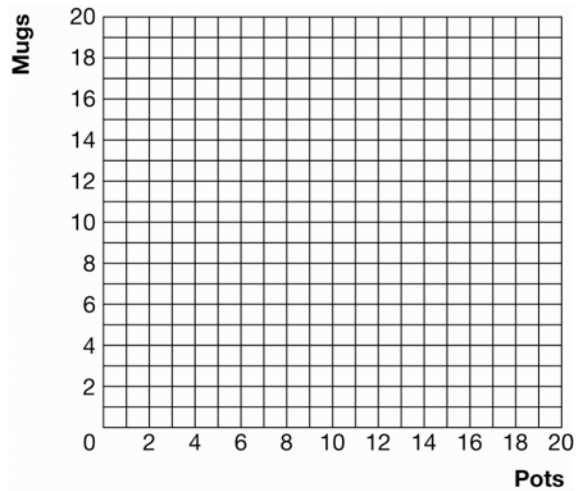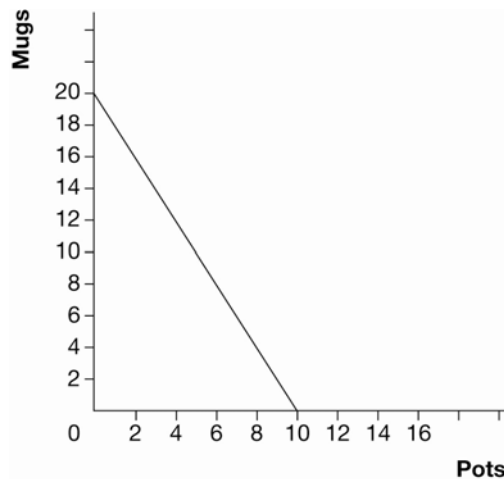## Chapter 3

1. Angela is a college student. She takes a full load of classes and has only 5 hours per week for her hobby. Angela is artistic and can make 2 clay pots per hour or 4 coffee mugs per hour.

a. Draw Angela's production possibilities frontier for pots and mugs.

Exhibit 2

Answer:
See Exhibit 5

Exhibit 5

b. What is Angela's opportunity cost of 1 pot? 10 pots?

Answer:
2 mugs. 20 mugs.

c. What is Angela's opportunity cost of 1 mug? 10 mugs?

Answer:
1/2 pot. 5 pots

d. Why is her production possibilities frontier a straight line instead of bowedout like those presented in Chapter 2?

Answer:
Because Angela's productivity in pot and mug production is constant – it doesn't depend on how many mugs or pots she is making. Therefore the opportunity cost of mugs in terms of pots is constant (and, of course, so is the opportunity cost of pots in terms of mugs).

2. Suppose a worker in Germany can produce 15 computers or 5 tonnes of grain per month. Suppose a worker in Poland can produce 4 computers or 4 tonnes of grain per month. For simplicity, assume that each country has only one worker.
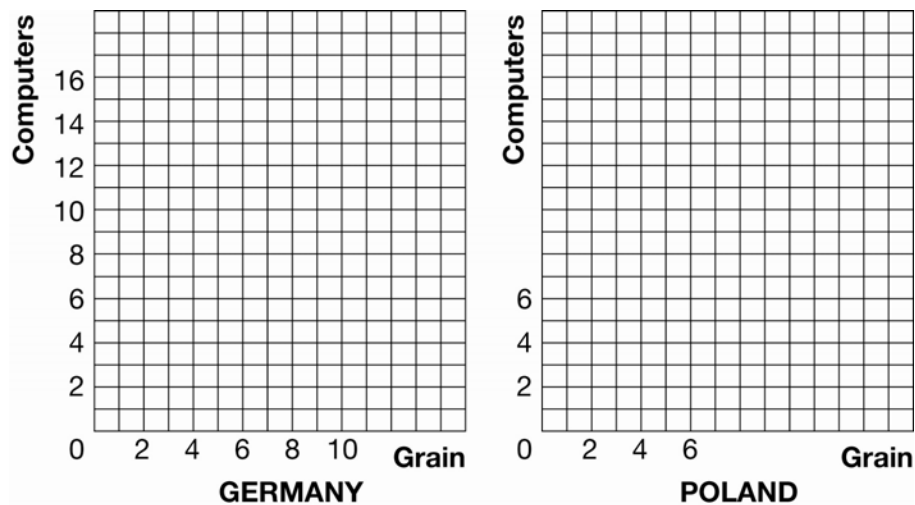
a. Fill out the following table:

	Computers	Grain
Germany	_____	_____
Poland	_____	_____

Answer:

	Computers	Grain
Germany	15	5
Poland	4	4

b. Graph the production possibilities frontier for each country in Exhibit 3.
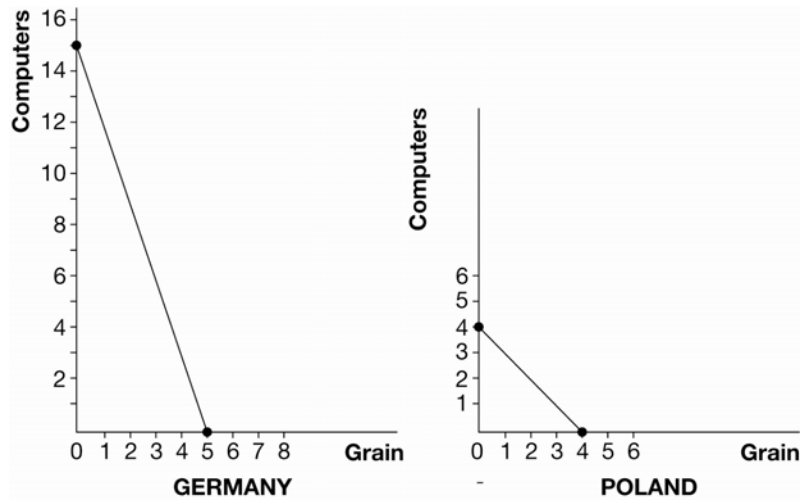
Exhibit 3

GERMANY   POLAND

Answer:
See Exhibit 6.

Exhibit 6

GERMANY | POLAND

c.   What is the opportunity cost of a computer in Germany? What is the opportunity cost of a tonne of grain in Germany?

Answer:
1/3 tonne of grain. 3 computers.

d.   What is the opportunity cost of a computer in Poland? What is the opportunity cost of a ton of grain in Poland?

Answer:
1 tonne of grain. 1 computer.

e.   Which country has the absolute advantage in producing computers? Grain?

Answer:
Germany because one worker can produce 15 computers compared to 4. Germany because one worker can produce 5 tonnes of grain compared to 4.

f.   Which country has the comparative advantage in producing computers? Grain?

Answer:
Germany because a computer has the opportunity cost of only 1/3 tonne of grain compared to 1 tonne of grain in Poland. Poland because a tonne of grain has the opportunity cost of only 1 computer compared to 3 computers in Germany.

g.   Each country should tend toward specialization in the production of which good? Why?

Answer:
Germany should produce computers while Poland should produce grain because the opportunity cost of computers is lower in Germany and the opportunity cost of grain is lower in Poland. That is, each has a comparative advantage in those goods

h.   What is the range of prices for computers and grain for which both
   countries would benefit from trading with each other?

Answer:
Grain must cost less than 3 computers per tonne to Germany. Computers must cost less than
1 tonne of grain per computer to Poland.

i.   Suppose Germany and Poland settle on a price of 2 computers for 1
        tonne of grain or 1/2 tonne of grain for a computer. Suppose each
        country specializes in production and they trade 4 computers for 2
        tonnes of grain. Plot the final consumption points on the graphs you
        made in part (b) above. Are these countries consuming inside or
        outside of their production possibilities frontier?

Answer:
See Exhibit 7. They are consuming outside their production possibilities frontier.

Exhibit 7
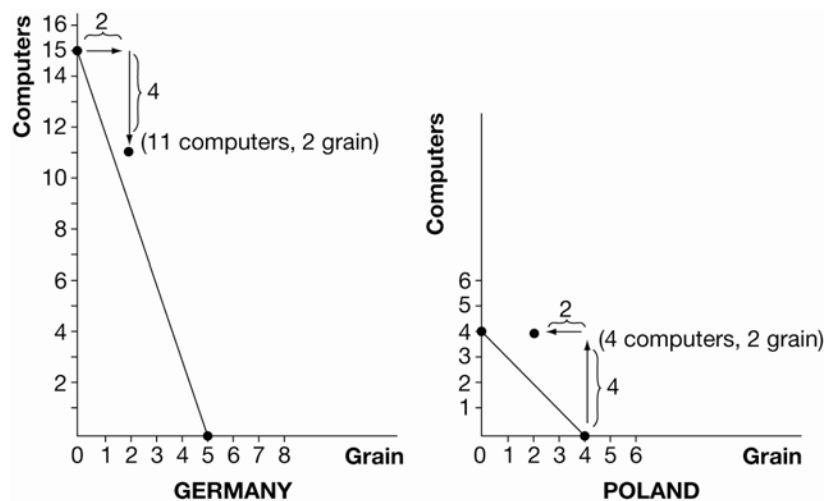
GERMANY   POLAND

j.   Suppose the productivity of a worker in Poland doubles so that a
        worker can produce 8 computers or 8 tonnes of grain per month. Which
        country has the absolute advantage in producing computers? Grain?

Answer:
Germany because one worker can produce 15 computers compared to 8. Poland because
one worker can produce 8 tonnes of grain compared to 5.

k.   After the doubling of productivity in Poland, which country has a
        comparative advantage in producing computers? Grain? Has the
        comparative advantage changed? Has the material welfare of either
        country changed?

Answer:
Germany has comparative advantage in computers. Poland has comparative advantage in
grain. No change in comparative advantage. Poland is better off, however, because it now
has a larger set of choices.

l.   How would your analysis change if you assumed, more realistically, that each country had 10 million workers?

Answer:
It would not change absolute advantage or comparative advantage, or any of the results of the analysis. It would just change the scale in the previous two graphs by a factor of 10 million.

3.   Suppose a worker in the United States can produce 4 cars or 20 computers per month while a worker in Russia can produce 1 car or 5 computers per month. Again, for simplicity, assume each country has only one worker.

a.   Fill out the following table:

	Cars	Computers
United States	_____	_____
Russia	_____	_____

Answer:

	Cars	Computers
United States	4	20
Russia	1	5

b.   Which country has the absolute advantage in the production of cars? Computers?

Answer:
United States because one worker can produce 4 cars compared to 1. The United States because one worker can produce 20 computers compared to 5.

c.   Which country has the comparative advantage in the production of cars? Computers?

Answer:
In both, the opportunity cost of 1 car is 5 computers. In both, the opportunity cost of 1 computer is 1/5 of a car. Therefore, neither has a comparative advantage in either good.

d.   Are there any gains to be made from trade? Why?

Answer:
No. Each can get the same trade-off between goods domestically.

e.   Does your answer in (d) above help you pinpoint a source for gains from trade?

Answer:
Yes. There needs to be differences in opportunity costs of producing goods across countries for there to be gains from trade.

f.   What might make two countries have different opportunity costs of production? (Use your imagination. This was not directly discussed in Chapter 3.)

Answer:
The availability of resources or technology might be different across countries. That is, workers could have different levels of education, land could be of different quality, capital could be of different quality, or the available technology might be different.