Name: Solutions

Cosumnes River College
Principles of Microeconomics
Problem Set 1
Due January 29, 2015

Spring 2015
Prof. Dowell

Instructions: Write the answers clearly and concisely on these sheets in the spaces provided. Do not attach extra sheets.

1. The following graph shows the production possibilities frontier for a small country in the Caribbean.

a. If the country is currently producing 180 coconuts and 0 sugar, how many coconuts must they give up to make 20 sugar? 20

b. If the country is currently producing 100 coconuts and 60 sugar, how many coconuts must they give up to move to 80 sugar? 40

c. Does this country have increasing opportunity costs? Explain how you know that they do or do not and what it means to have increasing opportunity costs.
Yes. The PPF gets steeper or is bowed out moving from 180 coconuts and zero units of sugar to zero coconuts and 100 units of sugar. The answers to a and b also illustrate the increasing opportunity cost.

d. Give an example of a combination of coconuts and sugar that is attainable but not efficient and an example that is not attainable.
Any point that lies under the PPF, such as point A (representing 100 coconuts and 40 units of sugar) is attainable but not efficient. Any point above the PPF such as B (representing 120 coconuts and 80 units of sugar) is unattainable.
e. What two factors might shift the production possibilities frontier for this country? State what
the factor is and then give an example related to the production of sugar and coconuts.
*Increased labor (say from immigration) – more labor with given land would increase
production. Improvements in harvesting technology would have the same effect.*

2. Explain how a production possibility curve for agriculture goods and manufacturing goods
would shift after each of the events described below:

a. A drought in the Midwest reduces agricultural yield per acre.
   *It would shift or rotate inward along the axis labeled “agricultural goods.”*

b. Advances in computer technology lower the cost of producing manufactured goods but
do not affect the cost of producing agricultural goods.
   *It would shift or rotate outward along the axis labeled “manufacturing goods.”*

c. Civil war disrupts the production of all goods equally in the United States.
   *It would shift in along both axes.*

3. A clothing accessory company produces scarves and earrings. Below are the production
possibility combinations it can produce with the resources that it has.

<table>
<thead>
<tr>
<th>Point</th>
<th>Scarves</th>
<th>Earrings</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>b</td>
<td>9</td>
<td>50</td>
</tr>
<tr>
<td>c</td>
<td>8</td>
<td>90</td>
</tr>
<tr>
<td>d</td>
<td>7</td>
<td>120</td>
</tr>
<tr>
<td>e</td>
<td>6</td>
<td>145</td>
</tr>
<tr>
<td>f</td>
<td>5</td>
<td>165</td>
</tr>
<tr>
<td>g</td>
<td>4</td>
<td>185</td>
</tr>
<tr>
<td>h</td>
<td>3</td>
<td>200</td>
</tr>
<tr>
<td>i</td>
<td>2</td>
<td>215</td>
</tr>
<tr>
<td>j</td>
<td>1</td>
<td>225</td>
</tr>
<tr>
<td>k</td>
<td>0</td>
<td>230</td>
</tr>
</tbody>
</table>

a. Draw the production possibility curve in the space below placing “earrings” on the vertical axis.

b. Suppose technological advances increase production of both earrings and scarves by 10%
without increasing costs. Demonstrate the effect of this innovation on the production
possibility curve you drew above.

c. What is the slope of the PPF between points e and f? What does this slope mean?
   \[
   \text{slope} = \frac{\text{rise}}{\text{run}} = \frac{145 - 165}{6 - 5} = -20
   \]
   *This means we must give up 20 pairs of earrings to get one scarf.*

d. Suppose the slope of the PPF were constant. (It isn’t) If it were, what would this
indicate?
   *It would indicate constant opportunity cost.*
4. Workers in the United States and Brazil can produce shoes and computers. The annual productivity of a worker in each country is given in the table below:

<table>
<thead>
<tr>
<th>Country</th>
<th>Computers</th>
<th>Shoes</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>5,000</td>
<td>8,000</td>
</tr>
<tr>
<td>Brazil</td>
<td>1,000</td>
<td>5,000</td>
</tr>
</tbody>
</table>

United States’ PPF

Brazil’s PPF

a. On the graphs above, draw each country’s production possibilities frontier. For simplicity assume each country has only one worker who works for the entire year. (Make sure you put the numbers on the axes.)

b. Which country has the comparative advantage in each good? How do you know? Explain.

The slope of the PPF (rise/run) is the opportunity cost of what is on the vertical axis (shoes) in terms of what is on the horizontal axis (computers). Hence, the slope is the opportunity cost of computers measure in shoes. The invers of the slope is the opportunity cost of shoes in terms of computers. These costs are shown in the table below:

<table>
<thead>
<tr>
<th>Country</th>
<th>1 Computer</th>
<th>1 Shoe</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>8/5 shoe</td>
<td>5/8 computer</td>
</tr>
<tr>
<td>Brazil</td>
<td>5 shoes</td>
<td>1/5 computer</td>
</tr>
</tbody>
</table>

The U.S. must give up 8/5 of a shoe to produce a computer while Brazil must give up 5 shoes. The U.S. has the lowest opportunity cost for computers and hence a comparative advantage in producing them. The situation is just the opposite for Brazil. Brazil’s opportunity cost for a shoe is only 1/5 of a computer. For the U.S., the opportunity cost of a shoe is 5/8 of a computer. Brazil has the lowest opportunity cost for shoes and hence the comparative advantage.
c. Predict the pattern of trade.
    
    *Brazil will produce shoes and the U.S. will produce computers. Brazil will trade their shoes to the
    U.S. for computers.*

d. Indicate the range of possible relative prices that would bring about this pattern of trade.
    
    *The relative price must lie between 8/5 shoes (the U.S. opportunity cost) and 5 shoes (the Brazilian
    opportunity cost) per computer.*