ECN 221 ~ Practice with comparative advantage and gains from trade.

The principle of comparative advantage states that if nations (or individuals) specialize in the production of goods and services that they can produce at lower opportunity cost relative to other nations, then there can be mutual gains from trade. As a result, there will be more efficient production and consumption. In terms of the PPF model is that these gains from trade allow nations to consume product mixes outside of their own PPF. Note: trade does not cause a shift in the PPF, rather it allows a nation to consume a mix of the two goods that is beyond what they could produce alone.

Example to see gains from trade:

Assume that Heather and Leah can spend the day either washing cars or mowing lawns. The table below shows how much of each task they could accomplish in one day if they spent the whole day doing just that task. For example, Heather could wash 20 cars or mow 5 lawns in one day.

<table>
<thead>
<tr>
<th></th>
<th>Heather</th>
<th>Leah</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cars washed</td>
<td>20</td>
<td>15</td>
</tr>
<tr>
<td>Lawns mowed</td>
<td>5</td>
<td>3</td>
</tr>
</tbody>
</table>

Question: Use the principle of comparative advantage to illustrate how specialization can make them more productive than they can be alone.

Steps:

1. Calculate the opportunity cost of each activity for each person.

   **Heather**
   - The opportunity cost of mowing 5 lawns is washing 20 cars.
   - ⇒ the opportunity cost of mowing 1 lawn is washing 4 cars.
   - ⇒ the opportunity cost of washing 1 car is mowing 1/4 of a lawn.

   **Leah**
   - The opportunity cost of mowing 3 lawns is washing 15 cars.
   - ⇒ the opportunity cost of mowing 1 lawn is washing 5 cars.
   - ⇒ the opportunity cost of washing 1 car is mowing 1/5 of a lawn.

2. Use the opportunity costs to see who has comparative advantage (lower opp cost) in each good, and therefore who should specialize in each good.

   Heather has a lower opportunity cost for mowing lawns so she has the comparative advantage in lawns (she gives up only 4 cars while Leah gives up 5 cars).

   Leah has a lower opportunity cost for washing cars so she has the comparative advantage in cars (she gives up only 1/5 of a lawn while Heather gives up 1/4 of a lawn).

   ⇒ Heather should specialize in mowing lawns and Leah should specialize in washing cars.
3. Use the opportunity costs of each good to figure out how much they would be willing to pay or accept in a trade.

Since Heather is doing all the lawn mowing and Leah is doing all the car washing, we can see that Heather will trade some lawns for Leah's car washing.

Questions:  
   a) how many lawns would Heather be willing to mow for Leah if Leah washes one car for Heather?  
   b) how many lawns would Leah accept as a trade for each car she washes for Heather?

Answers:  
   a) Heather would mow up to \( \frac{1}{4} \) of a lawn, but not more, for each car that Leah washes for her (because this is her opportunity cost or what she would have to give up if she washed a car herself).  
   b) Leah would accept anything above \( \frac{1}{5} \) of a lawn, but not less, for each car that she washes for Heather.

Notice that there is a "window" of opportunity for trade. Any amount of lawns between \( \frac{1}{4} \) and \( \frac{1}{5} \) will be acceptable to both Heather and Leah and make them both better off.

Example of a mutually beneficial trade:

Suppose Heather mows 6 lawns for Leah.

What is the most that Leah would pay Heather (in car washes) for these 6 lawns?  
→ Leah will pay up to 30 cars for this because for her the opportunity cost of 1 lawn is 5 cars, so the opportunity cost of 6 lawns is 30 cars.

What is the least that Heather will accept for these 6 lawns?  
→ Heather will accept anything greater than 24 cars for this because for her the opportunity cost of 1 lawn is 4 cars, so the opportunity cost of 6 lawns is 24 cars.

If Leah gives Heather 27 cars for the 6 lawns (or any other number between 24 and 30) then they will both be better off.

Heather gets 27 cars washed at a "price" of only 6 lawns - if she were to wash 27 cars herself she would have to give up 6.75 lawns (27 x 0.25) - she is therefore better off by \( \frac{3}{4} \) of a Lawn.

Leah gets 6 lawns mowed at a "price" of only 27 cars - if she were to mow 6 lawns herself she would have to give up 30 cars (6 x 5) - she is therefore better off by 3 cars.