Chapter 22 worksheet on Gains from Trade

To answer all problems in this worksheet, suppose that the U.S. and Japan each produce cars and TVs using labor as the only input according to the table below:

<table>
<thead>
<tr>
<th></th>
<th>Hours of Labor</th>
<th>Wage Rate per Hour</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>per car</td>
<td>per TV</td>
</tr>
<tr>
<td>U.S.</td>
<td>800</td>
<td>200</td>
</tr>
<tr>
<td>Japan</td>
<td>1200</td>
<td>400</td>
</tr>
</tbody>
</table>

1. Who has the comparative advantage in
   a. TV production? Why?
   b. car production? Why?

2. Over what range of exchange rates (in dollars per yen) will cars be cheapest in
   a. the U.S.?
   b. Japan?

3. Over what range of exchange rates (in dollars per yen) will TVs be cheapest in
   a. the U.S.?
   b. Japan?

4. Over what range of exchange rates will both countries be importing and exporting? Explain.

5. Suppose the U.S. has 8 million hours of labor per year to allocate between the production of cars and TVs. Draw the PPF for the U.S.

6. Suppose that, of the range of exchange rates for which trade occurs (in 4), it is at the least favorable end for the U.S. Draw the consumption possibilities curve (CPC) for the U.S. given that it specializes in the good that it has the comparative advantage in. What does the CPC look like when the exchange rate is at the most favorable end of the range?

7. How do the PPC and CPC illustrate the "gains from trade"?

8. As dollars per yen increase, are consumers in the U.S. better or worse off? What about producers in the U.S.?

9. Suppose that the U.S. and Mexico have a closed economy and allows no imports or exports. Demonstrate how allowing trade in a particular good affects consumers and producers in the importing and exporting country. Also, show that on net, society is made better off.
Answer Key for Worksheet on Gains from Trade

1a. The U.S. has the comparative advantage in TV production because its opportunity cost per TV is 1/4 car, which is less than Japan's opportunity cost of 1/3 car.
b. Japan has the comparative advantage in car production because its opportunity cost per car is 3 TVs, which is less than the U.S. opportunity cost of 4 TVs.

2. The cost of a car in the U.S. is $20 \times 800 = $16000. The cost of a car in Japan is 100 yen \times 1200 = 120,000 yen. The exchange rate that makes the cost of cars identical is $16000 = 120,000 yen, or $.133 per yen.
a. If the exchange rate is greater than $.133 per yen, U.S. cars are cheaper (to both countries).
b. If the exchange rate is less than $.133 per yen, Japanese cars are cheaper (to both countries).

3. The cost of a TV in the U.S. is $20 \times 200 = $4000. The cost of a TV in Japan is 100 yen \times 400 = 40,000 yen. The exchange rate that makes the cost of cars identical is $4000 = 40,000 yen, or $.10 per yen.
a. If the exchange rate is greater than $.10 per yen, U.S. TVs are cheaper (to both countries).
b. If the exchange rate is less than $.10 per yen, Japanese TVs are cheaper (to both countries).

4. If the exchange rate is between $.10 and $.13 per yen, both countries will be importing and exporting. The U.S. will export TVs and import cars, and vice versa for Japan.

5. The PPC is computed by taking 8 million hours and dividing by the necessary hours per unit of the two commodities (8m/800 per car = 10,000 cars; 8m/200 per TV = 40,000 TVs).

6. The CPC for the exchange rate of $.10 per yen (most favorable to U.S.) is computed as follows. First, the U.S. will specialize and produce 40,000 TVs. This will generate 40,000 \times $4000 = $160 million. At $.10 per yen, a Japanese car costs $.10 per yen \times 120,000 yen = $12,000. Thus, the U.S. could buy up to 13,333 cars ($160 million divided by $12,000 per car). The CPC for exchange rate of $.13 per yen is computed in a similar way, with the cost of a Japanese car now at $.13 per yen \times 120,000 yen = $16,000. Thus, at the most favorable exchange rate for the U.S., they can trade 3 TVs per car (the opportunity cost of a car in Japan). At the least favorable exchange rate, they pay 4 TVs per car (the opportunity cost of a car in the U.S.).

7. The fact that the CPC when the exchange rate is $.10 per yen is further to the right than the PPC indicates that, with trade, the U.S. can consume more than it can produce. If, however, the exchange rate were $.13 per yen, the U.S. would receive no gains from trade since the PPC and CPC would be identical. At the $.13 per yen exchange rate, all of the gains from trade accrue to Japan.
8. As yen per dollar increase, consumers in the U.S. are made worse off since the cost of imported goods will rise. On the other hand, U.S. producers are made better off since the higher price of imported goods drives up the demand for U.S. goods and the price that the U.S. producers receive.

9. The example below demonstrates who the winners and losers are when trade is allowed and the U.S. begins importing copper and Mexico exports the copper.

<table>
<thead>
<tr>
<th></th>
<th>U.S.</th>
<th>Mexico</th>
<th>U.S.+Mexico</th>
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<tbody>
<tr>
<td></td>
<td>copper market</td>
<td>quantities in millions of lbs per year</td>
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A. **U.S.**
   1. before trade: P=12, Q=20
   2. after trade: P=10, Qs=14, Qd=28; imports=14
      i. increase in consumers surplus=48m
      ii. decrease in producers surplus=34m
      iii. net improvement=14m

B. **Mexico**
   1. before trade: P=7, Q=15
   2. after trade: P=10, Qd=12; Qs=26; exports=14
      i. increase in producers surplus=$61.5m
      ii. decrease in consumers surplus=$40.5 m.
      iii. net improvement=$21m.

C. **Results:**
   1. consumers in the importing country win.
   2. producers in the importing country lose.
   3. consumers in the exporting country lose.
   4. producers in the exporting country win.
   5. on net, gains exceed losses in both countries.