100 points. Allocate your time efficiently.

1. You are an economist for the City Subway Commission. Presently the price of a subway ride is $0.80, and 250,000 seats are filled weekly. The price elasticity of demand for subway rides is -0.40.

The Commission has just approved a subway price increase of $0.10 per ride. The Commission wants to know if it can use the opportunity to retire two aging subway cars that each provides 5,000 seats weekly. When the price hike goes into effect, can neither, one, or both cars be retired?

2. In *Free Enterprise: The Economics of Cooperation* (Federal Reserve Bank of Dallas), Author Dwight Lee notes that

> we have all heard arguments like this one: Something is wrong with the economy when wrestling stars are paid a lot more than nurses, since nurses are obviously more valuable than wrestlers. As we will see such arguments are flawed….[p. 7]

Explain in what way this argument is flawed. After all, is it not true that people get paid what they are worth?

3. Consider the information in the table below. Assume that South Carolina can produce either 10 cars or 20 cases of peaches (or a linear combination of the two) in one week. Assume that Georgia can produce 32 cars or 16 cases of peaches (or a linear combination of the two) in one week.

<table>
<thead>
<tr>
<th>State</th>
<th>Cars</th>
<th>Peaches</th>
</tr>
</thead>
<tbody>
<tr>
<td>South Carolina</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>Georgia</td>
<td>32</td>
<td>16</td>
</tr>
</tbody>
</table>

a. Which country has a comparative advantage in the production of cars?
b. Which country has a comparative advantage in the production of peaches?
c. If each state produces cars for one week and then peaches for one week, show the total production of both goods.
d. Now assume each state specializes for two weeks. Indicate the total production of both goods. Show that trade between the two states after this two week period can allow both states to consume both more peaches and cars.

4. How many people does it take to make a pencil? What is the process that leads all these people to cooperate so that pencils can be produced? Explain.
Essay

1. Suppose that the local utility regulators have recently approved an increase in the price of electricity from 10¢ per kilowatt-hour to 10.5¢ per kilowatt-hour. The long-run price elasticity of demand for electricity is estimated to be -1.2.

   (i) By how much will the quantity demanded of electricity drop in the long run because of this price increase?
   (ii) When the price of electricity increases, will consumers' total expenditures on electricity rise or fall in the long run? (Hint: Consider which is larger, the percentage increase in price or the percentage decrease in quantity demanded.)
   (iii) The cross elasticity of demand for electricity with respect to natural gas is 0.2. By how much would the price of natural gas have to change to totally offset the effect that the price increase in electricity has on the quantity of electricity consumed? In other words, by how much would the price of natural gas have to change to cancel out the fall in the quantity demanded that you calculated in part i?

2. You are an economist for the City Subway Commission. Presently, the price of a subway ride is 80¢, and 250,000 seats are filled weekly. The price elasticity of demand for subway rides is -0.40, and the income elasticity of demand is -0.60.

   (i) The Commission wants to ensure that the subway has enough excess capacity to handle any extra demand that might occur during an economic decline. If a recession lowered area incomes by 5%, how many additional seats per week would the subway need?
   (ii) The Commission has just approved a subway price increase of 10¢ per ride. The Commission wants to know if it can use the opportunity to retire two aging subway cars that each provide 5,000 seats weekly. When the price hike goes into effect, can neither, one, or both cars be retired?

Answer Section

ESSAY

1.
   (i) The price rises by 5%, so the quantity demanded falls by $1.2 \times 5\%$ or 6%.
   (ii) Consumers' total expenditures equal the price they pay times the quantity they purchase. The rise in price (5%) is more than offset by the fall in quantity demanded (6%), so consumers' total expenditures must fall.
   (iii) The price of natural gas must rise by $6\% \div 0.2$ or 30%.

2.
   (i) Income falls by 5%, so the quantity demanded rises by $0.60 \times 5\%$ or 3%. The number of seats required rises by $3\% \times 250,000$ or 7,500 seats.
   (ii) The price increase is 12.5%, so quantity demanded falls by $0.40 \times 12.5\%$ or 5%. The number of seats demanded falls by $5\% \times 250,000$ or 12,500 seats. The two aging cars provided only 10,000 seats, so both cars can be retired when the price increases.