COMM 220 – PRACTICE PROBLEM SET 1

1. (a) Statistics Canada calculates the Consumer Price Index (CPI) using a similar basket of goods for all cities in Canada. The CPI is 143.2 in Vancouver, 135.8 in Toronto, and 126.5 in Montreal. A 1,250 sq. ft. apartment unit located in the downtown area is selling for $300,000 in Vancouver, $290,000 in Toronto, and $280,000 in Montreal. Which city has the highest real price of an apartment unit and which city has the lowest?

   (b) The price of long-distance telephone service fell from 25 cents per minute in 2000 to 10 cents per minute in 2006. The Consumer Price Index increased by 15-percent over this period. What is the percentage change in the real price of long-distance telephone service from 2000 to 2006?

   (c) When John graduated from college, he got a job with a starting salary of $36,000. When John's brother Paul graduated four years later, his starting salary was $40,000. Paul likes to tease John about earning more than John did right out of college. The CPI rose 15 percent during the four years separating the brothers' graduations. Does Paul actually have the higher salary in real dollars?

2. The Canadian government is interested in analyzing the domestic market for wheat. The staff economists estimate the following equations for the domestic supply and demand curve:

   $$Q_D = 880 - 70P$$
   $$Q_S = 240 + 90P$$

   Quantities are measured in millions of bushels and prices are measured in Canadian dollars per bushel.
   (a) Calculate the equilibrium price and quantity that will prevail in a completely free market, that is, a purely competitive market.
   (b) Calculate the price elasticities of supply and demand at the equilibrium price and quantity.
   (c) The government currently has a $5.00 per bushel support price in place. What impact will this support price have on the market? Will the government be forced to purchase wheat under the program that requires them to buy any surpluses? If so, how many bushels? And how much?
   (d) Illustrate part (a) and (c) on a graph. Be sure to label your graph clearly.

3. Northern Energy Company is interested in obtaining quick estimate of the weekly supply and demand curves for coal. The firm's research department informs you that the price elasticity of supply is approximately 0.8, the price elasticity of demand is approximately –0.64, and the current price and quantity are $40 and 1280, respectively. Price is measured in C$ per ton and quantity is measured in tons per week.
   (a) Estimate the weekly supply and demand curves at the current price and quantity.
   (b) What impact would a 20% increase in weekly demand and a 10% decrease in weekly supply have on the equilibrium price and quantity?
   (c) What is the percentage change in the equilibrium price and quantity caused by the 20% increase in demand and 10% decrease in supply?

(d) Illustrate the supply and demand curves in part (a) and (b), and their equilibrium prices and quantities on the same graph. Be sure to label your graph clearly.

4. Suppose that the current price of a product is $30 per unit. At this price, 18,000 units will be sold. If the price is lowered to $24, sales will increase to 20,000 units.
   (a) What is the price elasticity of demand at $30 and at $24?
   (b) What is the arc elasticity of demand over the price range of $24 and $30?
   (c) Derive the equation for a linear demand curve.
   (d) What would happen to revenue if the price were to increase by 20% from $30?
   (e) What conclusion can you draw from the result of part (d)?
   (f) Using the demand curve derived in (c), determine the consumer surplus when the price of the product is $30 per unit and the change in consumer surplus when the price is lowered to $24.

5. Suppose that the current price of a good is $12, and 25,000 units are demanded at this price. The price elasticity of demand for the good is –1.5.
   (a) Calculate the change in consumer surplus when the price of the good drops by 10 percent.
   (b) Calculate the change in consumer surplus when the price of the good rises by 10 percent.