Economics 202
Dr. Smith

Problem Set #7

1. The market for broccoli is described by the following expressions:

   Demand: $Q(P) = 9000 - 300P$ **Q is measured in bushels of broccoli.**
   Supply: $Q(P) = -1000 + 100P$

   a. Graph the "demand" and "supply" curves. Be sure to label your axes, the curves, and the intercepts.
   b. Find the equilibrium quantity and price in the broccoli market.
   c. Calculate the consumer and producer surplus when the market is at the equilibrium you found in part b).
   d. Now, suppose that a price control is implemented in this market. If the government imposes a price control of $10 per bushel, then how will this affect the market? Specifically:
      i. Has the government established a price floor or a price ceiling? How do you know this?
      ii. Has the price control created excess supply or excess demand? Show your work.
      iii. How has this affected the efficiency of the market? Identify any changes in consumer surplus or producer surplus. Also, be sure to identify any deadweight loss (DWL) that has been generated by the price control.

2. The market for six packs of microbrewery beer in Asheville, North Carolina is described by the following expressions:

   Demand: $Q(P) = 1000 - 50P$ **Q is measured in six packs.**
   Supply: $Q(P) = -200 + 100P$

   a. Graph the "demand" and "supply" curves. Be sure to label your axes, the curves, and the intercepts.
   b. Find the equilibrium quantity and price in this market.
   c. Now, suppose that the government imposes a two dollar (per six pack) per unit tax on beer.
      i. Find the new quantity exchanged, the producer's price, and the consumer's price.
      ii. How much tax revenue is generated by the per unit tax?
      iii. Calculate the amount of deadweight loss created by the tax.
      iv. Who pays a larger share of the tax? How do you know this? Does it make sense to you intuitively? Why or why not?
   d. Now, suppose that the government imposes a ten percent sales tax (*ad valorem* tax) on beer.
      i. Find the new quantity exchanged, the producer's price, and the consumer's price.
      ii. How much tax revenue is generated by the tax?
      iii. Calculate the amount of deadweight loss created by the tax.
      iv. Who pays a larger share of the tax?

3. The market for land in Mocksville is described by the following equations:

Demand: $Q(P) = 2000 - 4P$ **Q is measured in acres.**
Supply: $Q = 500$

a. Graph the "demand" and "supply" curves. Be sure to label your axes, the curves, and the intercepts.
b. Find the equilibrium quantity and price in this market.
c. Now, suppose that the government imposes a two hundred dollar per acre tax on land.
    i. Find the new quantity exchanged, the producer's price, and the consumer's price.
    ii. How much tax revenue is generated by the per unit tax?
    iii. Calculate the amount of deadweight loss created by the tax.
    iv. Who pays a larger share of the tax? How do you know this? Does it make sense to you intuitively? Why or why not?
d. How is the concept of economic rent important in this example?

4. Bob's demand for visits to the doctor is given below. Bob faces a flat fee if he makes a visit to the doctor: $100.

Inverse Demand: $P(Q) = 200 - 4Q$ **Q is measured in trips to the doctor.**
Inverse Supply: $P = 100$

a. Graph the "demand" and "supply" curves. Be sure to label your axes, the curves, and the intercepts.
b. Find the equilibrium quantity and price in this market.
c. Now, suppose that Bob gets health insurance that provides him with a subsidy. The health insurance company provides Bob with an $60 per visit subsidy.
    i. Find the new quantity of doctor's visits made by Bob, the producer's price, and the consumer's (Bob's) price.
    ii. How much does the subsidy program cost the insurance company?
    iii. Calculate the amount of deadweight loss created by the subsidy.

5. Elasticity

a. Go back to question #2. Calculate the price elasticity of demand and supply at the equilibrium you calculated in part b. Does your elasticity calculation make sense in light of your answer to c(iv)?
b. Go back to question #3. Calculate the price elasticity of demand and supply at the equilibrium you calculated in part b. Does your elasticity calculation make sense in light of your answer to c(iv)?
c. Go back to question #4. Calculate the price elasticity of demand and supply at the equilibrium you calculated in part b.