First Homework

1.   Suppose the demand for standard household air freshener in the US is $Q_d=100-25P$ where Q_d is monthly quantity demanded in millions and P is the price per unit in dollars and cents. Suppose the marginal private cost (MPC) of producing air freshener is one dollar.

   A.   Illustrate in a diagram and calculate the market equilibrium quantity.

   B.   Explain what a marginal private cost of one dollar means. Does that mean the total opportunity cost of producing air freshener is unrelated to how many are produced?

   C.   Assume that the marginal private benefit (MPB) of air freshener equals the marginal social benefit (MSB). Explain what that means.

   D.   At the equilibrium calculated in part A, was every consumer who purchased air freshener willing to pay exactly one dollar for the good? Explain.

   Assume some of the petrochemicals used to produce air freshener are hazardous to the health of those living near the manufacturing plants. Suppose the external (health) cost generated equals forty cents for each air freshener produced.

   E.   Illustrate and calculate the efficient equilibrium.

   F.   Have we eliminated all external health costs related to the manufacture of the good? If not, why do we consider the equilibrium in part E efficient?

2. Suppose the graph below represents the abatement costs and marginal damage
    of sulfur dioxide generated by the
    Rio Bravo energy plant in Bakersfield CA.
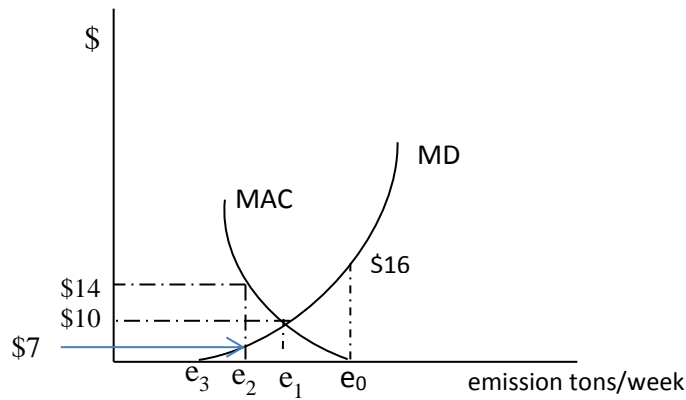
A. What level of weekly sulfur dioxide emissions actually begins to damage society?
B. Argue that society should not allow the Rio Bravo plant to emit more than the
   level you specified in part A.
C. Now make the economic argument that it would be inappropriate to limit the
   plant's emissions to the level specified in part A.
D. Identify the level of emissions in which marginal abatement cost (MAC) equals
   marginal damage (MD).
E. Argue that the emissions level where MAC equals MD is socially efficient. What
   is meant by social efficiency?
F. Why is e_0 *too much* emissions? Compare MAC to MD at e_0 and explain why the
   emissions level is inefficient.
G. Explain why the economic approach to pollution normally tolerates some
   emissions and resulting social damage.