

**Homework Assignment 3. Due: Thursday, February 10.**

1. (4 points) Consider a group of college roommates considering throwing a party. The marginal benefit to hosts and guests is given by  $MB=100-Q$ . (You can think of  $Q$  as measuring the intensity of the party reflecting, in turn, both the time that party will last and the amount of booze and fun consumed.) Marginal private costs are given by  $MPC=20$ . The problem (?) is that people living next door don't like parties and hate the noise that they produce. Marginal damage to them is  $MD=10$ . What is the equilibrium amount of  $Q$  produced? What is the efficient level of  $Q$ ? Market for which good is absent in this case? What is the welfare gain from moving to efficient level of  $Q$ ? Suggest a Pigouvian tax that would induce efficient party size. What is the amount of tax revenues collected? Explain what would happen if the guys living next door were invited and came to the party.
2. (2 points) (problem 3 on page 108) For each of the following situations, is the Coase theorem applicable? Why or why not?
  - a. A group of college students in a dormitory share a communal kitchen. Some of the users of the kitchen never clean up the messes they make when cooking.
  - b. In Brazil it is illegal to catch and sell certain tropical fish. Nevertheless, in some remote parts of the Amazon River, hundreds of divers come to capture exotic fish for sale on the international black market. The presence of so many divers is depleting the stock of exotic fish.
  - c. In the state of Washington, many farmers burn their fields to clear the wheat stubble and prepare for the next planting season. Nearby city-dwellers complain about the pollution.
  - d. Users of the Internet generally incur a zero incremental cost for transmitting information. As a consequence, congestion occurs, and users are frustrated by delays.
3. (1 point) Is zero pollution level generally desirable? Explain why or why not?
4. (3 points) Consider a small bakery which produces bread for local residents. The marginal private benefit of this bakery is given by  $MPB=200-2Q$ . The marginal private costs are given by  $MPC=50$ . The ovens in the bakery operate on coal, and they emit carbon dioxide in the air as a by-product (carbon dioxide is believed to cause global warming). The marginal damage to other people because of that is given by  $MD=0.25Q$ . On the other hand, local resident enjoy positive externality each morning because of the nice smell of fresh bread. The marginal external benefit is given by  $MEB=12$ . How much bread is baker going to make? What is the efficient amount of bread?