Problem Set 2
(Due Thursday, March 2 in class)

We encourage you to work together, but each person must submit his/ her own responses. PLEASE WRITE YOUR NAME, SID, AND SECTION NUMBER ON EACH PAGE.

Question 1 True, false, or uncertain. Please answer and provide a SHORT explanation, correcting if false. (Please correct in a meaningful way, not by adding the word “not.”)
   a) If a policy maker is uncertain about the true demand curve, a tax is a preferred policy tool.
   b) The Coase theorem tells us that there is no reason to regulate externalities as long as property rights are clearly defined.

Question 2 After listening to all the practical examples in class, you feel that it is time to go and employ what you learned in the real world. So you decide to quit university and become an orange farmer. You purchase a piece of land with beautiful orange trees, and now need to decide what technology to use to spray pesticide(x) against a common pest, the Asian citrus leafminer. You inherited a contract for aerial spaying (I=0) when buying the land, but could invest in precision applicators instead (I=1). Assume that the cost of the pesticide and the relevant technology used are your only relevant input costs at this time and that the wholesale price for a pound of oranges is constant at $.50 cent due to a marketing order. The aerial application (K0) comes as no extra cost, while the precision application (K1) would require an additional investment of $150. Residue from the pesticide application contaminates groundwater. As a result, a tax might be imposed on orange farmers based on the level of pesticides found in groundwater. For simplicity, assume that technology 0 is only 50% effective while technology 1 ensures total effectiveness based on a given quality (q=.8) of your purchased land [g(.8,0)=.5);g(.8,1)=1]. The input price or price for the pesticide is $2 per gallon and your production function is given by f[x,g(q,I)]=100+80e-e^2, where e stands for effective input and e=xg(q,I).

I. Describe how you would go about deciding between the two technologies based on what you learned in class.
II. Write down your objective mathematically
III. Solve for your optimal input use given the two technologies without a pollution tax.
IV. Solve for your optimal input use given the two technologies with a pollution tax of $4 per unused unit of pesticide that runs into groundwater [1-g(q,I)].
V. Would you adopt or install precision applicators if there was no tax in place? What if legislation was past to require you to pay a tax?

Question 3 Externality and policy essay
Read the articles under “Related Readings” on the course website talking about San Francisco’s proposed tax on grocery bags. The following questions are based on these readings, the reader and lecture slides, but many of them ask to give your personal opinion. Some questions may not have a single “right” answer, but you can still lose points for failing
to support your contentions adequately. That said, conciseness is always appreciated and we ask you to try to limit your essay to no more than 1.5 pages!

I. These articles are dealing with trying to internalize the cost of an externality. Give at least three examples of the types of social costs associated with the distribution of plastic bags at supermarkets. (No numbers are needed.)

II. What is a Pigouvian tax? List other instruments that could be used to try to internalize this externality.

III. Who are the two main groups fighting the regulation, and why are they opposed to it? (Explain how the proposed regulation would likely affect them.)

IV. How would you as a consultant hired to examine the regulation go about finding the “socially optimal” tax?

V. Do you support the proposed tax? Why or why not?

VI. Based on your answers above (in III. particularly) and considering political power of the involved interest groups, what would be a likely outcome of the proposed regulation?

VII. After you answered VI, find information on a settlement (e.g. search online) and briefly state it.