You are encouraged to form study groups to work on these problems. However each student must hand in a separate assignment: the group can work together to discuss the papers and comment on drafts, but each study group member must write it up herself/himself. When emailing assignments, please include your name and the assignment number as part of the filename.

Please write the names of your study group members at the beginning of your homework to acknowledge their contributions.

- Write a response to the webinar presentation on "Economic Aspects of Sustainability." You might read some of the additional material I present on Blackboard (Course Documents \ Sustainability) or dig into the bibliographies of those articles. What ought to be the considerations of a society for sustainability?
- 2. Consider regulations of an industry with 2 sorts of plants, designated (with a complete failure of imagination) as type 1 and type 2. Costs for both types of plant are $c(y) = 10 2y + 0.3y^2$. Type 1 plants are dirtier and produce emissions at a rate of

 $e_1 = 0.2y_1 + 0.1y_1^2$; type 2 plants just $e_2 = 0.1y_2$. Each unit of output, y, is sold for a price of 4.

- a. Create a table of costs, revenue, and profit for different levels of output (integer values to 20 is sufficient, an easy spreadsheet table). Assuming that emissions are free, what level of output would each plant type choose?
- b. Suppose regulations capped plant emissions at 1 what level of output would the plants choose? Is this efficient is there a way to produce the same output with fewer emissions?
- c. Suppose emissions were taxed at a rate of \$1 per unit of emission what would be the new amounts of output chosen at each plant?
- d. (extra for Eco students) With a bit of calculus, find the optimal choices for any given emission tax. What is the marginal amount that a plant would be willing to pay for the last unit of emission?
- 3. Choose an academic paper on the topic of your final project (coordinate with your group). Write a short overview of this paper (250 words).