Problem Set 2
(due in class February 6, 2012)

1. Harvey’s net demands for goods 1 and 2 are (2, –3) and his endowment is (6, 5).
   a. What are his gross demands?
   b. Draw a diagram illustrating his budget line, his endowment, and his consumption. (Put good 1 on the horizontal axis.)
   c. Draw a dotted line to show what his budget line would be if the price of good 1 doubled and the price of good 2 stayed the same.

2. Peter has an endowment of 3 units of good x and 5 units of good y. He can buy and sell x at a price of $100, and y at a price of $200. He receives an income of $700 as alimony from a former spouse.
   a. Draw Peter’s budget line for x and y. Show his initial endowment of x and y on your diagram.
   b. Calculate the amount of x that he could afford if he bought only x and the amount of y he could afford if he bought only y.
   c. Write an equation for Peter’s budget.

3. Marilyn is a journalist. She is considering two possible jobs. One job is as an editor for a magazine. The other job is writing freelance articles and selling them to whoever will buy them. If she works for the magazine, she must spend 10 hours a day at work and commuting. She will be paid $130 a day net of commuting costs and taxes if she takes this job. If she writes freelance articles, she can work at home as many hours a day as she pleases. She estimates that she would earn $10 an hour after taxes if she does this. Her utility function is $U = (R^3)C$, where $R$ is the number of hours a day she spends not working or commuting and $C$ is her earnings.
   a. If Marilyn chooses to freelance, how many hours will she work?
   b. Calculate her utility in each job and identify which job she will choose.

4. The indirect utility function for a consumer with a utility function $U(x_1, x_2)$ is defined to be a function $V(p_1, p_2, m)$ such that $V(p_1, p_2, m)$ is the maximum of $U(x_1, x_2)$ subject to the constraint that the consumer can afford $(x_1, x_2)$ at the prices $(p_1, p_2)$ with income $m$.
   a. Find the indirect utility function for someone with the utility function $U(x, y) = 2x + y$.
   b. Find the indirect utility function for someone with the utility function $U(x, y) = \min\{ 2x, y \}$.
   Explain how you got your answers.