Problem Set #5
Due November 19, 1997

1. You are currently 40 years old (imagine that!) and you expect to work another 25 years before retirement. In your job as a public policy analyst, you are earning $40,000 a year and, unless you take steps to change that, you expect to continue earning that same amount in real terms for the rest of your working career. This is a problem, because while you do have a little savings put aside, just $5,000 in a savings account earning 5% a year nominal interest, you also owe $23,000 on credit cards (you have great credit, as a policy analyst) on which you are paying 18% a year nominal interest. The rate of inflation is just 2%.

   a) Your boss suggests the following option: take a course in benefit-cost analysis at the SPP (you didn't learn it the first time), and she will raise your pay to $45,000 a year. The course (it's a very special one, offered with a combination of a live professor and CD-ROM) will cost you $5,000 tuition up front, plus you will have to miss work without pay for 6 months starting 6 months from now. Your salary would go up starting a year from now.

      i) What is the present value to you of the increased pay you will get if you do this?
      ii) What is the present value of the cost to you of taking the course?
      iii) What, then, is the present value of taking the course *and* getting the raise?
      iv) Should you take the course or not? Write a one-paragraph, non-technical explanation of your decision for your spouse.

   b) Your doctor just told you that you have an incurable disease and have only 5 years to live, during which time the disease will not interfere with your performance as a policy analyst. Which of your answers in part (a) are changed by this news?

   c) Your lawyer just told you that your doctor faked his diploma from medical school, and you decide that there is a 70% chance that the doctor is wrong and you will live past retirement after all. What is now the present discounted *expected value* of taking the course and getting the raise?

   d) Doing your best to imagine yourself in the situation of part (c), tell us what you think would be the certainty equivalent for you personally of the course/raise. This is subjective, and there is no *correct* answer, but you should explain why your answer is higher, lower, or equal to the expected value from part (c).

   e) Sorry, your boss just learned of the disease and withdrew the offer. (Don't hold it against her – she just did it to be sure to get you back to the $40,000 salary as a starting point for the next question) But not to worry: you've also just learned from your brother-in-law about a drug he can get for you that, if you take it every day from now on, will stop the progression of the disease. How much would you be willing to pay a year for this drug, assuming that you believe that it will work?

Again, there is no correct answer to this; it is subjective. But see if you can provide some explanation for the number that you give.

f) Using your answer to part (e) (if it was zero, please go back and make it some positive number of $), calculate the value that you have implicitly placed on your life. (I can see several answers to this, so don't worry too much about being correct. But do think about what it all means.)

2. Suppose there are two kinds of workers in a community, skilled and unskilled, and they are in completely separate and unrelated labor markets where their respective wages are determined. Supply and demand are linear in both markets. In competitive equilibria the skilled wage is $24 an hour and skilled workers supply 100,000 hours, while the unskilled wage is $6 an hour and unskilled workers supply 200,000 hours. In order to redistribute income from skilled workers to unskilled workers, the local government levies a tax of $$x$ an hour on skilled workers only, and provides a subsidy also of $$x$/2 an hour to employment of unskilled workers. What this does to the two markets depends on the elasticities of supply, E^S (assumed the same for both types of labor), and demand, E^D (also the same for both markets). The table below gives you several values for these elasticities, as well as for x, the size of the tax.

a) For the values in each row of the table, calculate the new equilibrium wage rates received by skilled and unskilled labor, w_S and w_U respectively, the new quantities employed, L_S and L_U, the gains or losses in producer surplus (of workers) and consumer surplus (of employers) in both markets (PS_S, PS_U, CS_S, CS_U), the change in the government budget B, and the change in real income of the poor (unskilled workers) ΔY_P, and of the non-poor (everyone else, including taxpayers) ΔY_N. Finally, calculate the weight that would have to apply to the poor, $\hat{\omega}_P$, (with the weight on the non-poor equal to one) for the weighted gain to the poor to just equal the loss to the non-poor, and the implied leaky bucket ratio, c.

x	E^S	E^D	w_S	w_U	L_S	L_U	PS_S	PS_U	CS_S	CS_U	B	ΔY_P	ΔY_N	$\hat{\omega}_P$	c
$4	**1**	**1**													
$4	**2**	**1**													
$4	**1**	**2**													
$4	**0**	**1**													
$4	**1**	**0**													
$1	**1**	**1**													

b) Indicate, based on these results, whether this kind of tax/subsidy become **more** or **less** effective as a means of redistributing income as

i) Labor supply becomes more elastic

ii) Labor demand becomes more elastic

iii) The tax becomes larger