Problem Set #3
Due February 9, 2000

1. The University of Michigan, concerned about the nutritional deficiencies of students' diets, is considering providing a healthy lunch to all students free of charge every day. A small-scale pilot project has already been conducted, and it determined that a standardized "healthy lunch" can be provided at current prices for $3. Students (who are, remarkably, identical) would only be willing to pay $1.25 for this healthy lunch, but the benefits to society as a whole (including the students themselves, their parents, the university health service, etc.) are three times this large, or $3.75. U of M has therefore decided tentatively to go ahead with the project, providing 20,000 free lunches each day at several locations around campus.

   However, they have recently realized that this much demand for healthy food on the Ann Arbor market might raise its price, and if so this might render the project less beneficial than was thought. Unhealthy food is available at a constant cost that will remain unchanged by this policy, but the market for healthy food is smaller and might be affected by this large a purchase by U of M. Ann Arbor currently sells the equivalent of only 60,000 healthy lunches per day, all bought by non-students.

   Your job, therefore, is to conduct a sensitivity analysis of the free lunch project with respect to the assumed elasticities of supply and demand in Ann Arbor for healthy food. That is, for each elasticity combination listed below, first find the new equilibrium price of healthy food after the U of M adds its own demand for 20,000 lunches to the existing demand. Then calculate the various welfare effects indicated.

   Report your results in a table like the one below, but also accompany it with the details of how you got your results.

Elasticity of Supply:	Infinite			1.0			0.5	
Elasticity of Non-Student Demand:	0.0	1.0	0.0	1.0	2.0	0.0	1.0	2.0
New Equilibrium Price [a]								
Change in Non-Student Consumer Surplus [b]								
Change in Healthy Food Producer Surplus [b]								
Cost to UM [b]								
Benefit to Students, Parents, etc. [b]								
Net Benefit to Society [b]								

[a] $ per lunch. [b] Thousands of $ per day.

2. The University has fielded many complaints from students who would like to go to home sports events but who cannot because regular tickets are too expensive and only a few seats are set aside for students at the lower student ticket price. Reserving additional seats for students means adding an additional athletics fee to each student's tuition.

   The University is considering three options:

   - WB: Reserve 1,000 more seats for students at women's basketball games and charge each student a fee
   - MH: Reserve 1,000 more seats for students at men's hockey games and charge each student a fee
   - DN: Do nothing and charge no additional fee.

   Three groups on campus have weighed in on the issue (assume equal membership of 100 students in each group and 100% voting). Their preferences are:

	Diehard Wolverines (DW)	Moderate Fans (MF)	Sleepyheads (SH)
1st choice	MH	WB	DN
2nd choice	WB	DN	MH
3rd choice	DN	MH	WB

   a) Suppose there were a series of elections between successive pairs of these options, the winner in each pairwise election running against the third option until one option has beaten both of the others. What would be the result?

   b) Suppose U of M decides to have just two elections rather than a series of them: an election is held between two of the options, and the winner of that election is run off against the remaining option.

      i) If the first election is WB v. DN, what are the options in the SECOND election, and what is the result?

      ii) Does the order of elections matter? Why or why not?

   c) Until now you have assumed an equal number of students, 100, in each group. If you now change the number in one group, the Sleepyheads, is it possible that the problems you have identified will go away. That is, if you increase or decrease the number of Sleepyheads, does there come a point at which one of the options becomes able to win (not tie) elections against both alternatives? If so, what number of Sleepyheads accomplishes this, and which option wins? Consider both i) increasing the number of Sleepyheads, and ii) decreasing their number.