Math 104
Exam 2

Name: _____

To receive full credit, you must show all of your work. The use of graphing calculators is not permitted.

Problem	Points	
1	40	
2	20	
3	20	
4	20	
Total	100	

1. (20 points each) For each of the following games, find all of the Nash equilibria and determine whether a game is SSS. If a game is SSS, solve it and give each player's optimal strategy and payoff. If a game is not SSS explain why not and find each player's prudential and counter-prudential strategies and security level.

a)

		Player B		
		I	II	III
Player A	I	(0,2)	(5,3)	(2,1)
	II	(2,0)	(4,7)	(0,6)

b)

		Player B	
		I	II
Player A	I	(3,5)	(1,10)
	II	(-1,3)	(2,1)

2. (10 points each) Consider the following game

		Player B	
		I	II
Player A	I	(1,5)	(4,8)
	II	(2,3)	(5,6)

a) Suppose that Player B will move first. Could Player A use a threat to improve his payoff? If so, how should he lower one of his payoffs in order to make the threat credible?

b) Suppose that Player A will move first. Could Player B use a threat to improve his payoff? If so, how should he lower one of his payoffs in order to make the threat credible?

3. Company A and Company B are interested in marketing a new product. Each company advertises that its product is the best one and must decide whether to run the ads in the morning or in prime time. If both companies run their ads in the same time period, consumers will be skeptical of their competing claims and their sales will not change. If a company runs its ads unopposed in the morning it will gain 10 units in sales; if it alone advertises in prime time it will gain 20 units in sales.

a) (5 points) Write down the matrix for this game. Be sure to indicate the strategies represented by the columns and rows.

b) (15 points) Rank the following options in order of preference for each company (and explain your answer):

1. Wait for your competitor to make its move, then respond.
2. Move first.
3. Both companies decide to maximize their profits and move simultaneously.

4. (10 points each) The market for a new product will be either small, medium or large, depending on various factors. Assume that the probabilities of each of these outcomes are equal. Companies X and Y are competing for this market and each can choose from two plans: A or B. Suppose that Company X moves first and has conducted a market study so that it knows the state of the market. Company Y moves second but does not know what the market will be.

a) Write down a game tree for this game (leave the payoffs blank). Be sure to label all branches and indicate any information sets using dotted lines.

b) List all possible strategies for Company X and Company Y.