Midterm Exam: Economics 101 – May 8, 2003

You have one hour and fifteen minutes. Do all 3 questions; each have equal weight. Use two bluebooks. Put the answers to questions 1 and 2 in one bluebook, and the answer to question 3 in the other. You will get credit *only if you provide a clear explanation of your answer and how you got it.* Good luck.

1. Short Answers

For each of the normal form games below, find all of the Nash equilibria. Which are Pareto Efficient?

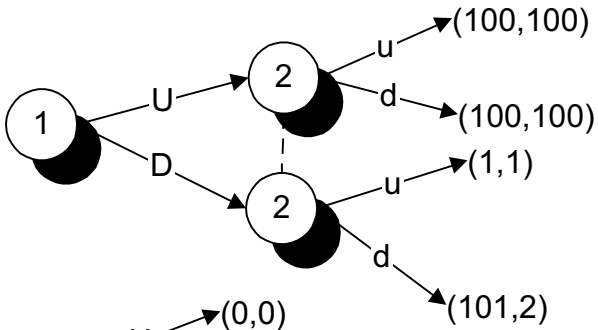
a)	L	R
U	1,0	3,1
D	2,2	1,0

b)

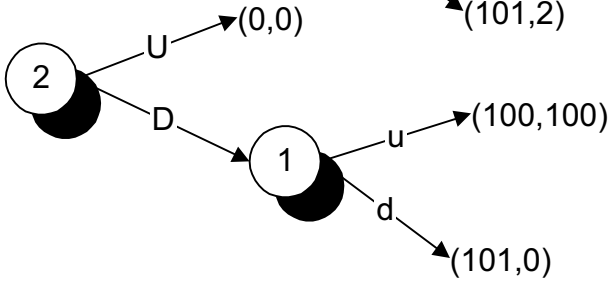
	L	R
U	2,5	6,3
D	0,9	4,7

For each of the extensive form games below, find the normal form and all Nash equilibria. Then find all of the subgame perfect equilibria. Which are Pareto Efficient?

c)



d)



2. Bertrand and Cournot with Differential Marginal Cost

Inverse demand is $p = (17 - (x_1 + x_2))$. Firm 1 produces at constant marginal cost of 1, firm 2 produces at constant marginal cost of 3.

Suppose first that firms compete to set quantities.

a) Find the profit for each firm as a function of the quantities of the two firms.

b) Find the Nash equilibrium quantities and the market quantity.

Now suppose that firms compete to set prices

c) Find the profit for each firm as a function of the prices of the two firms.

d) Find the Nash equilibrium price and the market quantity.

e) Is more output produced by the industry under Bertrand (price) or Cournot (quantity) competition?

3. How to sell a car?

You wish to sell a car that is worthless to you. There are two potential buyers, who value the car at \$2500 and \$3500 respectively. You may sell the car in a second price sealed bid auction in which the only possible bids are \$2400 and \$3400. Alternatively, you may sell the car by setting a take-or-leave-it price of either \$2400 or \$3400. In both cases the high value buyer moves first, and the low value buyer moves second after seeing the move of the high value buyer. In case of a tie, a coin is flipped to see who gets the car. You should assume that if winning the coin flip is worth \$x to a buyer and losing the coin flip is worth \$y to the buyer, this is equivalent to the buyer getting (\$x + \$y)/2.

a) Find the extensive form of this game.

b) Find the subgame perfect equilibrium of this *three* player game.