

14.12 Game Theory – Midterm I (Make up)
10/18/2001

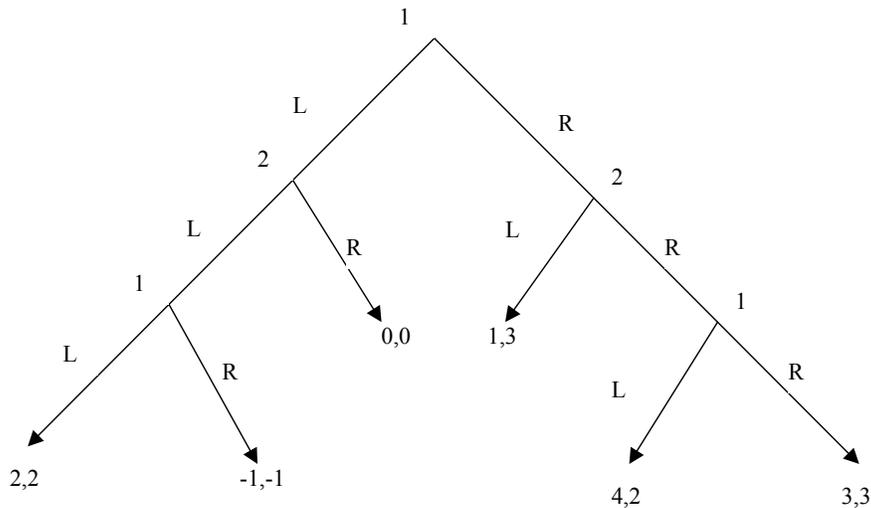
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Instructions. This is an open book exam; you can use any written material. You have one hour and 20 minutes. Each question is 25 points. Good luck!

1. Compute all the Nash equilibria in the following game.

1\2	L	M	R
T	3,2	4,0	0,0
M	2,0	3,3	0,0
B	0,0	0,0	3,3

2. Find all pure-strategy Nash equilibria in the following game. Which of these equilibria are consistent with common knowledge of sequential rationality?



3. Compute all pure-strategy Nash equilibria in the following game. Player 1 chooses some $x \in [0, 1]$. Observing x , player 2, either Approves (in which case 1 gets x utiles, 2 gets $1 - x$ utiles), or Rejects, in which case both get 0 utiles. Which of these equilibria are consistent with the common knowledge of sequential rationality of player 1, which of them are consistent with the common knowledge of sequential rationality of 2.
4. In this question you are asked to compute the rationalizable strategies in linear Bertrand-duopoly with “imperfect substitutes.” We have two firms $N = \{1, 2\}$, each with zero marginal cost. Simultaneously, each firm i sets a price $p_i \in P = [0, 10]$. The demand for the good firm i sells, as a function of p_1 and p_2) is

$$Q_i(p_1, p_2) = 1 + p_j - p_i.$$

Each firm i maximizes its own profit

$$\pi_i(p_1, p_2) = p_i Q_i(p_1, p_2).$$

- (a) Given any price p_j set by the other firm, what is the best price p_i^{BR} for firm i ?
Plot a graph of best response curves. (5 points)
- (b) Compute the pure strategy Nash equilibrium. (5 points)
- (c) Compute all the rationalizable strategies. (15 points)