

Stat/Econ 473 Game Theory
Problem Set 5

Due: Thursday February 11

From the Text: Do problems: 8.20–8.21, 9.11–9.13, 11.13–11.14, 11.18–11.19

1) (Centipede) Consider a two player game that proceeds as follows. Player 1 has the first and third move. Player 2 has the second and 4th move. We start with a pot of \$6. On the first three rounds the Player whose turn it is decides to grab the pot (G) or continue (C). If a Player decides to grab the pot they get $2/3$ of the pot and the other player gets $1/3$ of the pot. If he decides to continue, the pot is multiplied by $3/2$ and it the next players turn. At Player 2's last turn he decides either to grab the pot (G) or share (S). If he chooses to grab it is divided as above. If he chooses to share it is divided in half.

- a) Draw the game tree for the extensive form of this game.
- b) What are the pure strategies for each player?
- c) What is the backward induction solution?
- d) Write down the strategic form of the game and find all Nash equilibria.

2) Two players must choose between three alternatives A, B and C. Player 1 prefers A to B to C while Player 2 prefers C to B to A. We begin by having Player 1 veto one of the candidates. Player 2 then chooses one of the remaining candidates.

- a) Draw the game tree for the extensive form of this game. (Assign payoffs the reflect the preferences of each player.)
- b) What are the pure strategies for each player?
- c) What is the backward induction solution?
- d) Write down the strategic form of the game and find all Nash equilibria.