Game Theory **Andreas Blume**
Principles **4th Homework**

1. Find all Nash equilibria of the following zero-sum game:

Column

		West	East
Row	Top	5	-2
	Bottom	-7	4

2. (a) Which general principle guides the search for mixed-strategy equilibria in both zero-sum games and non-zero-sum games?

   (b) In a two-person zero-sum game a strategy that is part of a mixed-strategy Nash equilibrium can be viewed as a recommendation for play. Why?

3. Solve for all mixed and pure strategy Nash equilibria in the games:

	L	R
U	9,9	0,8
D	8,0	7,7

	L	R
U	9,4	1,2
D	2,1	3,8

	L	R
U	9,4	1,5
D	2,9	3,8

4. Consider the following voting game: Three voters simultaneously vote on two alternatives. One voter, voter 1, prefers alternative 1, the other two voters, voters 2 and 3, prefer alternative 2. The payoff from seeing one's preferred alternative win is 2. The payoff from seeing one's preferred alternative lose is 0. The payoff from a tie is 1. Voter 1's cost of voting is $c_1 \in (0, 1)$. Voters 2 and 3 each have a cost of voting equal to $c_2 \in (0, 1)$.

   (a) Find a Nash equilibrium.

   (b) In equilibrium, how does voter participation vary as a function of the costs of voting?

   (c) What is the intuition for the predicted variation of voter participation as a function of the costs of voting?