

ECON 302: Assignment 4
 Winter 2016, Instructor: Huan Xie
 Due Thursday, April 7, 2016, 12pm put in my mailbox

1. Consider the following battle-of-sex game played by husband and wife. Both of them choose whether to watch a football game or a movie in the weekend. Choices are made independently and simultaneously. Payoffs are presented below. (30 points)

		Wife	
		Football	Movie
Husband	Football	9,5	0,0
	Movie	0,0	5,9

- (1) Find all pure strategy Nash equilibria.
- (2) Suppose Husband chooses Football with probability p , Wife chooses Football with probability q . Determine Husband's best response to any choice of q by Wife, and Wife's best response to any choice of p by Husband. Find all mixed strategy Nash equilibrium.
- (3) Show these reaction functions and all of the equilibria on a graph.
2. A monopolist is facing a threat of entry by another firm. First the entrant decides whether or not to enter, and then the incumbent decides whether or not to cut its price (fight) in response. If the entrant decides to stay out, it gets a payoff of 0 and the incumbent gets a payoff of 10 as a monopolist. If the entrant decides to enter the market, two firms' payoff depends on whether the incumbent fights or not. If the incumbent fights, then both firms end up with a negative payoff -5. If the incumbent decides not to fight, they divide the market profit and both get a payoff of 5. Draw the extensive form of the game and solve the backward induction outcome.(20 points)
3. Consider the following public goods game. A group has 4 members. Each group member i is endowed with \$10 and needs to allocate x_i (x_i is an integer between 0 and 10) out of the \$10 to a public account and $10 - x_i$ to a private account. The total amount in the public account is the summation of the money allocated by all group members. Each dollar from the public account gives 50 cents as a return to each group member, and each

dollar from the private account gives a full return of \$1 to the group member who owns it. The payoff for each player is the total payoff from the public account and the private account. (50 points)

- (1) Specify what are the players, strategies, and the payoffs of the game. Write down the payoff as a function of x_i .
- (2) Solve all of the pure-strategy Nash equilibria.
- (3) What is the efficient outcome of the game? Is it one of the equilibrium outcome(s)? If not, explain why the efficient outcome cannot be achieved.