COMP323 - Introduction to Computational Game Theory

Tutorial 1 - Questions

Problem 1. You are given the following bimatrix games. For each one, find all pure Nash equilibria.

(a) (Prisoner's Dilemma)

		Player 2	
		Quiet	Fink
Player 1	Quiet	2 , 2	0 , 3
	Fink	3 , 0	1 , 1

(b) (Matching Pennies)

		Player 2	
		Head	Tails
Player 1	Head	1 , -1	-1 , 1
	Tails	-1 , 1	1 , -1

(c) (Battle of the Sexes)

		Girl	
		Theatre!	OK, football...
Boy	OK, theatre...	1 , 5	0 , 0
	Football!	0 , 0	5 , 1

(d) (Battle of the Sexes... modified)

		Girl		
		Theatre!	OK, football...	Football great, I will invite my dad
Boy	OK, theatre...	1 , 5	0 , 0	0 , 0
	Football!	0 , 0	5 , 1	-1 , 2

Problem 2. You are given the following bimatrix game.

		Player 2 L	*Player 2* R	
Player 1	T	3 , 2	1 , 6	$\leftarrow p(T)$
	M	5 , 6	0 , 5	$\leftarrow p(M)$
	B	0 , 7	2 , 2	$\leftarrow p(B)$
		$\uparrow$ $q(L)$	$\uparrow$ $q(R)$	

A strategy profile (p, q) is given for two cases (a) and (b):
(a) $p = (p(T), p(M), p(B)) = \left(\frac{1}{4}, \frac{1}{4}, \frac{1}{2}\right)$ and $q = (q(L), q(R)) = \left(\frac{2}{3}, \frac{1}{3}\right)$.
(b) $p = (p(T), p(M), p(B)) = \left(\frac{1}{5}, \frac{4}{5}, 0\right)$ and $q = (q(L), q(R)) = \left(\frac{1}{3}, \frac{2}{3}\right)$.
For each of these cases answer the following:
(1) What is each player's expected payoff?
(2) Is (p, q) a Nash equilibrium?