Name:

Problem 1

Consider the following game:

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

What pure strategy profiles of this game are Rationalizable?

Problem 2

Using the game from the last problem, what are all the pure- and mixed-strategy Nash equilibria?

Problem 3

Consider this Bayesian game, where each game has a 1/2 probability of occurring.

	L	R
T	2,3	0,0
B	3,0	1,1

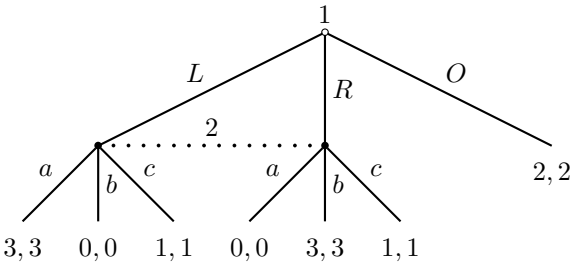
	L	R
T	4,3	2,0
B	2,0	0,1

Suppose neither player knows what game is begin played, what are all the pure-strategy Bayes Nash equilibria?

Problem 4

Consider the game from the last problem. Now suppose the row player knows which game is being played, but the column player does not. What are the pure strategy Bayes Nash equilibria?

Problem 5



For each of these strategy profiles, first say whether or not they are Nash equilibria, sub-game perfect equilibria, and whether they are part of a weak sequential equilibrium. If they are part of a weak sequential equilibrium, provide the beliefs that are the other part of the sequential equilibrium

A. (L, a)

- Nash equilibrium? Yes No
  If not, what is a better response?

- Sub-game perfect equilibrium? Yes No
- Weak sequential equilibrium? Yes No
  If so, what are the beliefs?

B. (R, c)

- Nash equilibrium? Yes No
  If not, what is a better response?

- Sub-game perfect equilibrium? Yes No
- Weak sequential equilibrium? Yes No
  If so, what are the beliefs?

Problem 5 continued on next page...

C. (O, c)

- Nash equilibrium? Yes No
  If not, what is a better response?

- Sub-game perfect equilibrium? Yes No
- Sequential equilibrium? Yes No
  If so, what are the beliefs?

D. (O, b)

- Nash equilibrium? Yes No
  If not, what is a better response?

- Sub-game perfect equilibrium? Yes No
- Sequential equilibrium? Yes No
  If so, what are the beliefs?

Problem 6

Consider the following indefinitely repeated game, where the probability of continuing is equal to 3/4.

	A	B
A	2,2	0,0
B	0,0	1,1

The strategy Grim-B starts by playing B and continues to plays B so long as the other player continues to play B. If the other player ever deviates from playing B, even for one round, Grim-B plays A for every round after. Is Grim-B a Nash equilibrium when played against itself in this repeated game? If so, illustrate why. If not, show the strategy that does better against Grim-B than it does against itself.

Problem 7

Consider the same repeated game and the same strategies, but with a continuation probability of 1/10. Is Grim-B against itself a Nash equilibrium? If so, illustrate why. If not show the strategy that does better.

Problem 7 continued on next page...

Problem 8

One more question about this same repeated game, with continuation probability of 1/10. Now consider the strategy Grim-A. Grim-A starts by playing A and continues playing A so long as the other player does the same. But if the other player ever deviates, he plays B from there out. Is Grim-A a Nash equilibrium of the repeated game? If so, illustrate why. If not, show the strategy that does better against Grim-A than it does against itself.

Problem 9

What are all the Nash equilibria of this game:

	A	B
A	2,2	0, 0
B	0,0	1, 1

Problem 10

Draw the phase portrait for the one-population replicator dynamics for the game in the previous problem.

Problem 11

Now draw the phase portrait for the two-population replicator dynamics for the same game (just drawing the general direction of motion in each of the four areas is fine).

Extra Credit

Problem 12

Consider this version of the Prisoner's dilemma:

	C	D
C	2,2	0,10
D	10,0	1, 1

For what values of δ (the probability of continuation) is Grim Trigger a Nash equilibrium of the indefinitely repeated game?

Problem 13

Provide an illustration of a game with a weak sequential equilibrium that is not a strong sequential equilibrium. You cannot use the one in the book or used in class.