

PROBLEM SET 5

1. Consider the game in the last page of the problem set. Find all three subgame-perfect Nash equilibria of the game, and note that player one chooses R as her first move in all of them. What would you do if you were player 1?
2. Consider twice-repeated PD with Bombing II:

	C	DC	Bomb
C	-1, -1	2, -5	-10, -10
DC	-5, 2	1, 1	-10, -10
Bomb	-10, -10	-10, -10	-20, -20

Game 1: PD with Bombing II

Show that, if δ is high enough, there is a Nash equilibrium where players play (DC, DC) in the first period of play. Is it subgame-perfect?

3. Show that there is $\underline{\delta}$ such that if $\delta \geq \underline{\delta}$, then there is an SPNE of twice repeated Γ_1 where the outcome is play (U, L) the first period.

	L	M	R
U	1, 1	-1, 2	0, 0
M	0, 0	-1, 0	1, 1
D	0, 0	1, 3	1, 0

Game 2: Γ_1

4. Do the following problems from Osborne's book: 459.1, 459.2, 459.3.
5. Consider Γ_3 in Figure 3 below. Show that there is $\underline{\delta}$ such that if $\delta \geq \underline{\delta}$, then there is an SPNE of infinitely-repeated Γ_3 where the outcome is play (U, L) in all even periods, and (D, R) in all odd periods.

	L	M	R
U	5, 1	-1, 3	0, 0
M	1, 0	2, 2	2, 0
D	6, 1	0, 6	1, 5

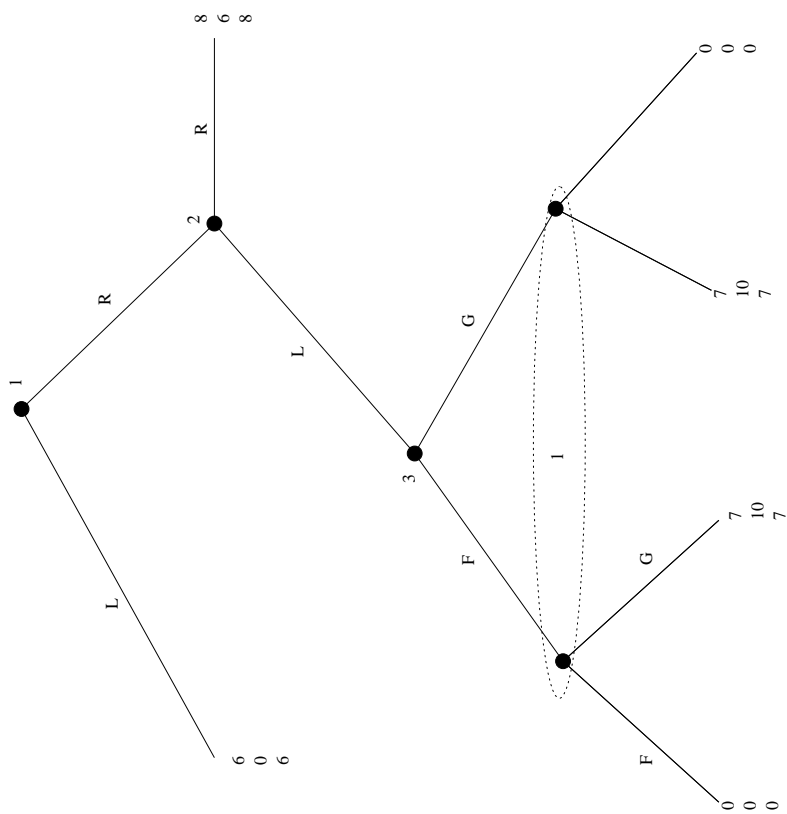
Game 3: Γ_3

6. Consider Γ_4 in Figure 4 below.

- Find all the Nash equilibria of Γ_4 .
- Consider strategies like the ones in lecture, where phase *Good* is “play (M, M) ”, *Bad 1* is “play (U, R) ”, and *Bad 2* is “play (D, L) ”. Show that the resulting strategy pair is not an SPNE of infinitely-repeated Γ_4 , for any $\delta \in (0, 1)$.
- Show that there is $\underline{\delta}$ such that if $\delta \geq \underline{\delta}$, then there is an SPNE of infinitely-repeated Γ_4 where the outcome is play (M, M) in each period. Hint: consider strategies with two phases: a “*Good*” phase and a “*Bad Both*” phase. If anyone deviates, go to the *Bad Both* phase for only one period, and then go back to *Good*. Write down these strategies carefully.

	L	M	R
U	7, 6	1, 0	1, 0
M	0, 3	2, 2	0, 1
D	0, 1	3, 0	0, 0

Game 4: Γ_4



Game 5: Another game