Homework 13

Question 1 : Consider a variant of the repeated prisoner's dilemma:

	HELP	CHEAT
HELP	(2,2)	(0,3)
CHEAT	(3,0)	(1,1)

This time neither player knows when the game is going to end. Each round, the game has a probability δ of continuing (and a probability $1-\delta$ of ending).

Consider a strategy where the first player chooses HELP until the second player chooses CHEAT. If the second player ever chooses CHEAT, the first player will always CHEAT until the game ends. This is known as the *Grim Trigger* strategy.

(a) What is the correct strategy for Player 2 if $\delta = 3/4$?

(b) Find all δ for which always HELP the best strategy for player 2.

Question 2 : Consider again the variant of the repeated prisoner's dilemma:

	HELP	CHEAT
HELP	(2,2)	(0,3)
CHEAT	(3,0)	(1,1)

Neither player knows when the game is going to end. Each round, the game has a probability δ of continuing (and a probability $1-\delta$ of ending).

Consider a strategy where the first player starts with HELP, and after that plays a strategy as follows: if in the previous round both players picked the same strategy, this round Player 1 chooses HELP, if in the previous round both players picked a different strategy, this round Player 2 chooses CHEAT.

(a) What is the correct strategy for Player 2 if $\delta = 3/4$?

(b) Find all δ for which always HELP the best strategy for player 2.

HINT: remember the geometric series formula. If $r < 1$, then $r + r^2 + r^3 + r^4 + \ldots = \frac{r}{1-r}$.