ECN 453: Homework 3

Due: Start of class Monday 29th November.
You can work in groups of up to 3 people (hand in one solution per group).

Instructions   Please neatly write your answers, staple them together, and submit this homework at the start of class on Monday 29th November.[1] If the work is too messy/hard to read it will not be graded. I encourage you to talk to your classmates about the homework, but make sure you can do all the problems. Don't forget to put the names of everyone in your group on the front. If you have questions come and talk to me in office hours, after class, or by email: nvreugde@asu.edu. Good luck!

1. New technology and market structure (30 points)

Consider an industry with market demand $Q = a - p$ and an infinite number of potential entrants with access to the same technology. Initially, the technology is given by $C = F + cq$. A new technology allows for a lower marginal cost $c' < c$ at the expense of a higher fixed cost $F' > F$.

   a. (30 points) Suppose that $a = 10, F = 2, F' = 3, c = 2, c' = 1$.[2] Determine the equilibrium price under both the old and new technologies.

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[1]If you can't come to class you can email me your solutions.

[2]To map it exactly onto the formula discussed in class, note that the demand curve implies that market size $S = 1$.

2. Repeated games (50 points)

Consider the following game and suppose that it is repeated an infinite number of times. Players have a discount value of δ.

Player 2

		L	R
Player 1	**T**	10 \ 10	0 \ 12
	B	12 \ 0	1 \ 1

a. (20 points) For what values of δ can collusion on (T,L) be sustained under the following grim trigger strategy:

- Play (T,L) if (T,L) has been played in all previous periods
- Otherwise play (B,R).

b. (20 points) Suppose instead that the payoffs from playing (B,R) are (0,0) (i.e. not (1, 1)). For what values of δ can collusion on (T,L) be sustained under the following grim trigger strategy:[3]

- Play (T,L) if (T,L) has been played in all previous periods
- Otherwise play (B,R).

c. (10 points) Explain in 1-2 sentences: why does your answer change between Part a and Part b?

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[3]This is the same grim trigger strategy in (a) but you will need to compute it with different payoffs.