

Homework 2

**** Due: Wednesday 25th September by 2pm (through the turn-it-in program)**

1) Suppose that demand is given by $P = 600 - 2Q$ and marginal cost equals 50. Firms are Cournot competitors and play a supergame. The collusive agreement being considered is for each to produce one-third of the monopoly output (there are 3 firms in this industry).

(a) What is the critical discount factor to sustain collusion using grim punishment strategies if detection of deviation requires 2 periods? (Hint: the cheating firm enjoys high profit for 2 periods. Then, they get punished forever after. You will need to show the derivation of δ again because it will be different from the one derived in class.)

(b) What is the critical discount factor to sustain collusion using grim punishment strategies if detection of deviation requires 3 periods? (Hint: You will need to show the derivation of δ again because it will be different from part (a))

(c) What will be the value of the critical discount factor to sustain collusion using grim punishment strategies if detection of deviation still requires 3 periods but the number of firm increases to 4?

This problem is adapted from Industrial Organization: A Strategic Approach by Church & Ware. Practice Question in Chapter 10. You can also try other problems as your practice for the midterm exam.