

Finance 510 Problem Set #6

- 1) Consider the game of chicken. Two players drive their cars down the center of the road directly at each other. Each player chooses SWERVE or STAY. Staying wins you the admiration of your peers (a big payoff) only if the other player swerves. Swerving loses face if the other player stays. However, clearly, the worst output is for both players to stay! Specifically, consider the following payouts.

(Player one's payoffs are in bold):

		Player Two	
		Stay	Swerve
Player One	Stay	-6 -6	2 -2
	Swerve	-2 2	1 1

- a) Does either player have a dominant strategy? Explain.
 - b) Suppose that Player B has adopted the strategy of Staying 1/5 of the time and swerving 4/5 of the time. Show that Player A is indifferent between swerving and staying.
 - c) If both player A and Player B use this probability mix, what is the chance that they crash?
- 2) The two most common paradigms for strategic interaction between firms are Cournot competition and Bertrand competition. Briefly describe the assumptions underlying the two models. What industries would you classify as Bertrand? What industries would you classify as Cournot? In which of the two models is competition the "fiercest"??
- 3) Suppose that the (inverse) market demand for fax paper is given by

$$P = 400 - 2Q$$

Where Q is total industry output. There are two firms that produce fax paper. Each firm has a constant marginal cost of production equal to \$40 and they are competing in quantities. That is, they each choose production levels simultaneously.

- a) Calculate the best response function for each firm (i.e. each firm's profit maximizing choice of quantity given the other firm's production levels)
- b) Calculate the Nash equilibrium for this industry. Calculate each firm's profits.

- c) Calculate the profit maximizing price/quantity for a monopolist facing the same demand curve (and with the same production costs). How does your answer compare to (b)?
- 4) Suppose that the (inverse) demand curve for Viagra is given by

$$P = 200 - 2Q$$

- Where Q is total industry output. The market is occupied by two firms, each with constant marginal costs equal to \$8.
- a) Calculate the equilibrium price and quantity assuming the two firms compete in quantities.
- b) How would your answer to (a) change if one of the firm's costs rose to \$10?
- c) Repeat parts (a) and (b) assuming the competition is in prices rather than quantities.
- 5) Bertrand competition is a very severe form of competition. In fact, with competition in prices, it only takes two firms in the marketplace to drive price down to marginal cost and profits to zero.
- a) How do capacity constraints influence the equilibrium in Bertrand competition?
- b) How does product variety influence the equilibrium in Bertrand competition?