Game Theory Worksheet #3 – IEDS Homework

1. Find the IEDS solution of the following game. Carefully show your work.

Player 1 \ Player 2	X	Y	Z
A	3, 3	0, 5	0, 4
B	0, 0	3, 1	1, 2

2. Refer a previous homework's problem.

Consider the following model of price competition. Two firms set prices in a market whose demand curve is given by the equation:

Q(uantity) = 6 – p(rice)

where p is the lower of the two prices. If firm 1 is the lower priced firm, then it is firm 1 that meets all of the demand; conversely, the same applies to firm 2 if it is the lower priced outfit. For example, if firms 1 and 2 post prices equal to 2 and 4 dollars, respectively, then firm 1—as the lower priced firm—meets all of the market demand and ,hence, sells 4 units. If the two firms post the same price p, then they each get half the market that is they each get $\frac{6-p}{2}$. *Suppose that prices can only be quoted in dollar units, such as 0, 1, 2, 3, 4, 5, or 6 dollars. Suppose, furthermore, that costs of production are zero for both firms.*

a. Show that posting a price of 0 dollars and posting a price of 6 dollars are both dominated strategies. What about the strategy of posting a price of $4? 5?
b. Suppose for a moment that this market had only one firm. Show that the price at which this monopoly firm maximizes profits is $3.
c. C. Based on your answer to the previous two questions, can you give a reason why—in any price competition model—a duopoly firm would never want to price above the monopoly price? (Hint: When can a duopoly firm that prices above the monopoly price make positive profits? What would happen to those profits if the firm charged a monopoly price instead?)
d. Show that when we restrict attention to the prices 1, 2, and 3 dollars, the (monopoly) price of 3 dollars is a dominated strategy.
e. Argue that the unique outcome to IEDS in this model is for both firms to price at 1 dollar.

These previous five questions have established a more general result about price competition: *In any model of duopoly price competition with zero costs the IEDS outcome is the lowest price at which each firm makes a positive profit, that is, a price equal to a dollar.*