PPOL 8640/ECON 6090 Assignment 4

Due: December 6^{th} at 6pm

1. (30 points) In an eBay auction, bidders submit bids throughout the duration of the auction, which has a specified ending time. When a bidder places a bid, the auction price, which is visible to all bidders, becomes the second-highest existing bid plus some minimum increment. Assume the minimum increment is \$1. So if the current price is \$70 and Bidder A is currently winning the auction (with a bid of \$75, though other bidders do not know Bidder A's exact bid), if Bidder B bids \$120 then Bidder B will currently be winning the auction and the price will now be \$76 (the \$75 bid by Bidder A is now the second-highest bid and there is a \$1 minimum increment).

   a What type of auction format is most similar to the eBay auction? What bid should the bidders place, keeping in mind that bids are a function of players' values?

   Suppose now that Bidder C bids \$92 and that is the last bid in the auction.

   b Answer the following

   - Who is the winner of the auction and what is the final price that is paid?
   - Assuming that the winning bidder had a value of \$120, and this value was the highest among all bidders. Is the auction efficient and how much consumer surplus did the winner receive?
   - Assuming the seller had a cost of \$50, how much profit did the seller receive?

   Now assume that the seller employs a shill bidder, who is not interested in winning the item, but places bids in an effort to drive up the final sales price for the seller. Suppose the shill bidder bids \$110.

   c Answer the following

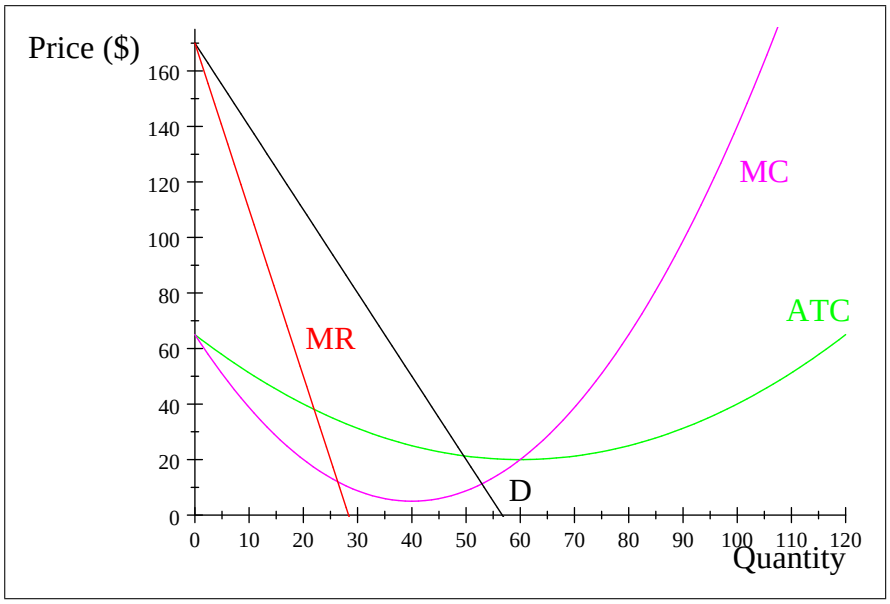
   - Who is the winner of the auction and what is the final price that is paid?
   - Assuming that the winning bidder had a value of \$120, and this value was the highest among all bidders. Is the auction efficient and how much consumer surplus did the winner receive?
   - Assuming the seller had a cost of \$50, how much profit did the seller receive?

   d Do you believe shill bidding falls is per se illegal given antitrust regulations? Explain why or why not.

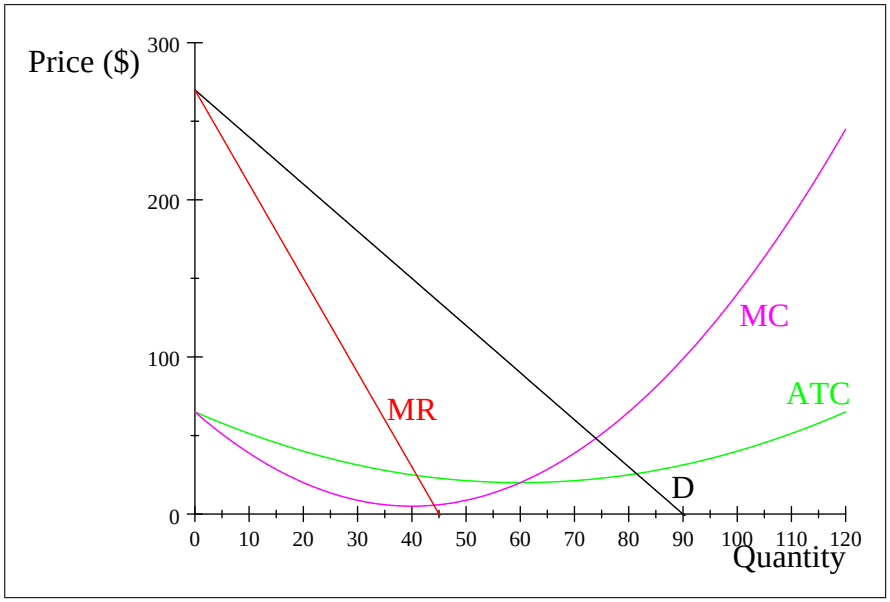
   e Suppose that the potential buyers in the auction decide to discuss who will bid and which bid(s) they will make. Do you believe this practice by buyers is per se illegal given antitrust regulations? Explain why or why not.

   f Suppose that instead of conducting an auction, a seller posts a price for the good but is willing to accept offers from buyers. Suppose that the seller posts a price of \$130, but negotiates a final price of \$111 with the same person who won the auction in part **c**. Is this practice per se illegal or likely to violate any antitrust regulations? Compare with your answer to parts **c** and **d**, and explain why the process of completing a transaction is important in determining antitrust violations.

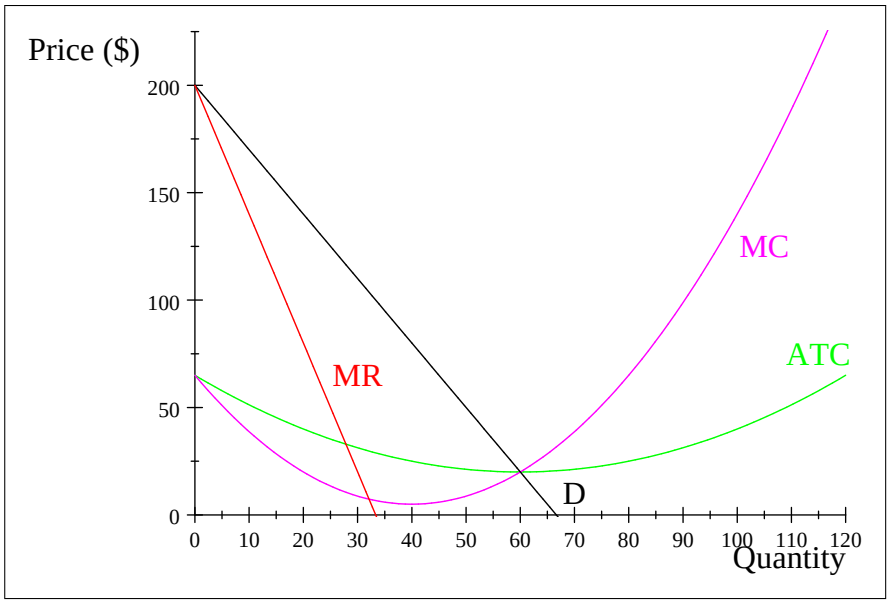
2. (15 points) We have discussed average cost pricing and marginal cost pricing. Suppose there are three monopolies with the demand and cost curves as given in the pictures:



Monopolist 1



Monopolist 2



Monopolist 3

Note that for Monopolist 3, demand, MC, and ATC all intersect at the same point (quantity of 60 and price of \$20)

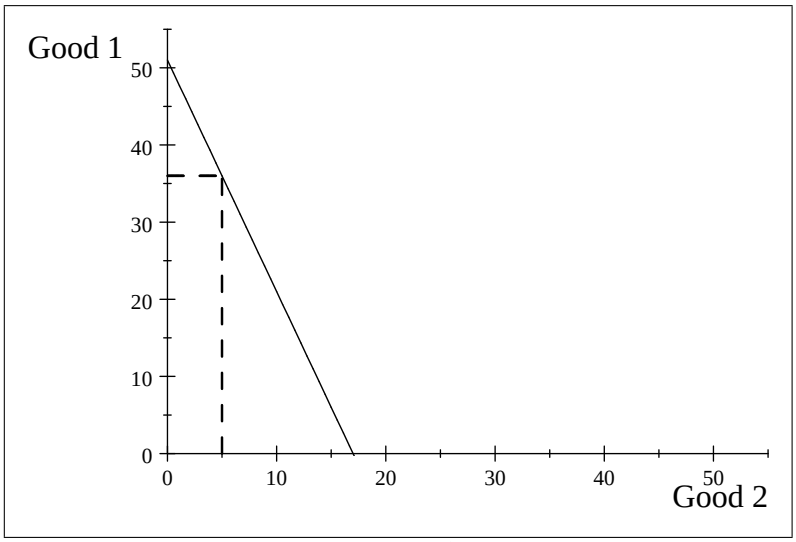
a Identify each monopolist's profit-maximizing price and output on their respective graph.

b Which of these monopolists, if any, meets the definition of natural monopoly? Explain.

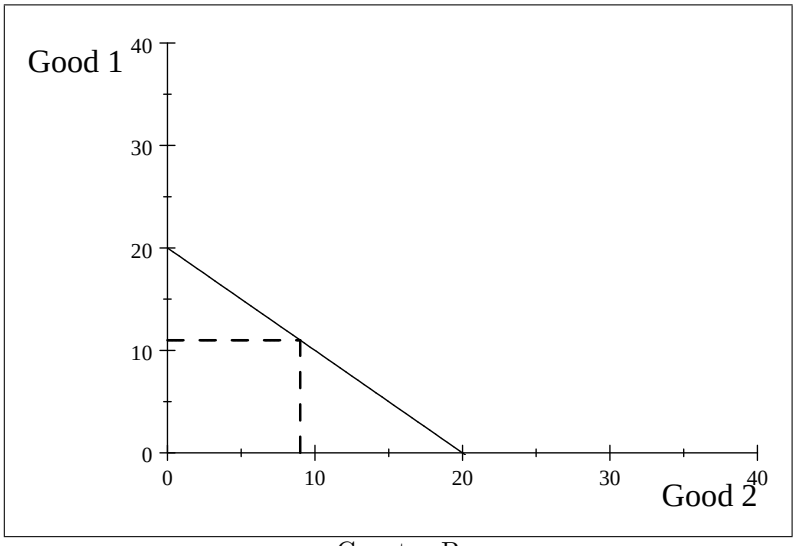
c For each of these monopolists, would average cost pricing or marginal cost pricing lead to the most efficient, in terms of least deadweight loss, market? Explain.

d Of the three monopolists, is there any monopolist for which marginal cost pricing is unsustainable? Explain.

3. (25 points) Consider an international trade market between two countries producing Good 1 and Good 2. The production possibilities curves for the two countries are in the figures below.



Country A



Country B

Country A can produce 51 units of Good 1 if it produces zero Good 2 and 17 units of Good 2 if it produces zero Good 1. In autarky, it chooses its optimal bundle as 36 Good 1 and 5 Good 2. Country B can produce 20 units of Good 1 if it produces zero Good 2 and 20 units of Good 2 if it produces zero Good 1. In autarky, it chooses its optimal bundle as 11 Good 1 and 9 Good 2.

a How much of Good 1 does Country A have to give up in order to produce a unit of Good 2? How much of Good 1 does Country B have to give up in order to produce a unit of Good 2?

b Which country is the lowest opportunity cost provider of each good? Should the countries specialize in different goods? Explain.

c Suppose the terms of trade are 2 units of Good 1 for 1 unit of Good 2. Explain why both countries would agree to these terms and draw the trading possibilities curve for each country.

d Given the terms of trade in part **c**, can the countries both consume more of both goods (when compared to their autarky economy) through specialization and trade or would at least one country have to produce some amount of both goods? Explain.

4. (30 points) Line City is a strip of land 30 miles long that runs east-west. As its name suggests, Line City is a perfect line. Residents live in houses which are distributed uniformly throughout the 30 miles – what this means is that they are evenly spaced along the line. There are two competing gas stations, Alpha Station and Bravo Station. They are attempting to determine where to locate their respective stations. They know that the residents of Line City will go to the gas station closest to their home, and if two gas stations are equidistant they will choose among the gas stations with equal probability (essentially the gas stations count these equidistant residents as half a customer). The objective of each station is to maximize the number (alternatively the proportion) of customers who visit their store and the firms only compete by choosing location.

   a Define the concept of Nash equilibrium.

   b Assume that residents of Line City are able to drive both east and west along Line City and that gas stations are free to locate anywhere along the 30 miles of the city. A Nash equilibrium to this game is a location choice for each gas station. There is one Nash equilibrium to this game. What is the Nash equilibrium? Explain why the set of locations you have identified is the Nash equilibrium.

   c A third gas station, Delta Station, has decided to compete. There is no Nash equilibrium to this game when there are three stations.[1] Explain why there are no Nash equilibria to this game.

   d The citizens of Line City are distressed because they like equilibrium. They have proposed to alter their city in the following manner. Gas stations are only allowed to locate between miles 14 through 16, while residents are now uniformly distributed over miles 0 through 14 and 16 through 30 (half the people live between mile markers 0 through 14 and the other half from mile markers 16 through 30 – I know it involves a lot of moving houses around but that's how seriously citizens of Line City take the concept of Nash equilibrium). Will this proposed structure solve the problem of no Nash equilibrium location choices? If so, find a Nash equilibrium. If not, explain why not.

   e In essence the citizens of Line City rezoned some land for gas stations. Compared to part **b**, how does this rezoning affect the consumers? Do they travel more or less with the rezoning?

[1] Technically there are Nash equilibria but they involve the stations choosing their locations by using a probability distribution, such as Alpha Station chooses to locate at mile marker 1 with 50% probability and mile marker 14 with 50% probability. Our concern is with the stations choosing a specific location (mile marker 9) with certainty.