FE210 Assistant Professor Schmitt Fall 2004

HOMEWORK FOUR – due Thursday October 21st

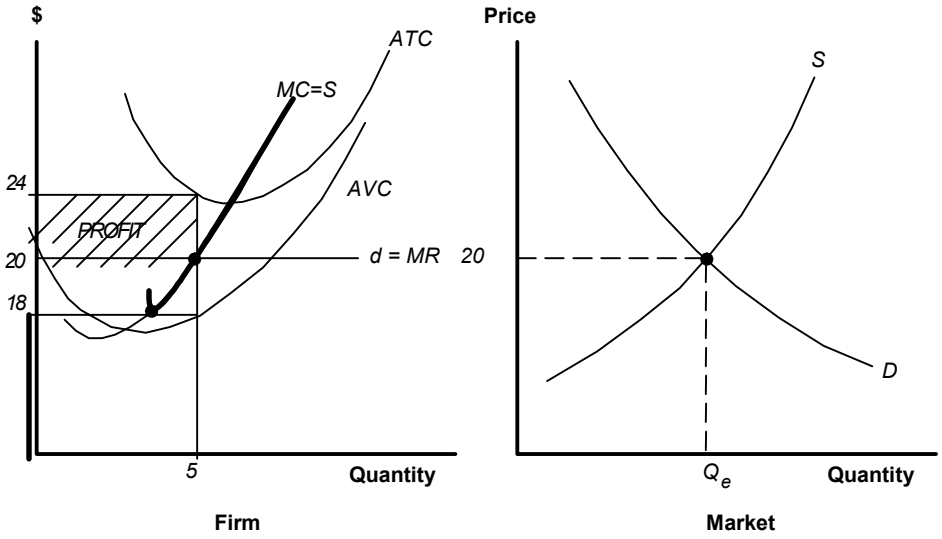
Name:_____

If you work with others please hand in your assignment in your own words and identify those you worked with. Make sure this assignment is handed in at the beginning of class.

1. The following table shows the total cost for a product that sells for $20 a unit.

Quantity	TC	TVC	MC	TR	MR	ATC	AVC	Profit
0	30	0	-	**0**	-	-	-	**-30**
1	55	**25**	**25**	**20**	**20**	**55**	**25**	**-35**
2	75	**45**	**20**	**40**	**20**	**37.5**	**22.5**	**-35**
3	85	**55**	**10**	**60**	**20**	**28.3**	**18.5**	**-25**
4	100	**70**	**15**	**80**	**20**	**25**	**17.5**	**-20**
5	120	**90**	**20**	**100**	**20**	**24**	**18**	**-20**
6	145	**115**	**25**	**120**	**20**	**24.16**	**19.16**	**-25**
7	185	**155**	**40**	**140**	**20**	**26.4**	**22.1**	**-45**
8	240	**210**	**55**	**160**	**20**	**24**	**26.25**	**-80**
9	310	**280**	**70**	**180**	**20**	**34.4**	**31.1**	**-130**
10	395	**365**	**85**	**200**	**20**	**39.5**	**36.5**	**-195**

a. Draw the perfectly competitive firm (include MC, MR, D, ATC and AVC) and the industry on side-by-side graphs. Also be sure to indicate the firm's short-run supply curve.



b. What is the output level for a profit maximizing firm? (Place your answers in the table).
q = 5 (MC = MR)

c. How does your answer change if price rises to $25?
q = 6 (MC = MR)

d. Calculate profit in b and in c above.
-20, 5 (total revenue is now P*Q = 25*6 – 145)

e. Should the firm stay in business at P = $20? At $25?
Yes both exceed fixed cost of -30

e. Suppose P = $15, what output level maximizes profits? What is the profit? Should the firm stay in business?
q = 4 (MC = MR), profit = -40, shut down

2. Consider the following demand schedule for a single-price monopolist.

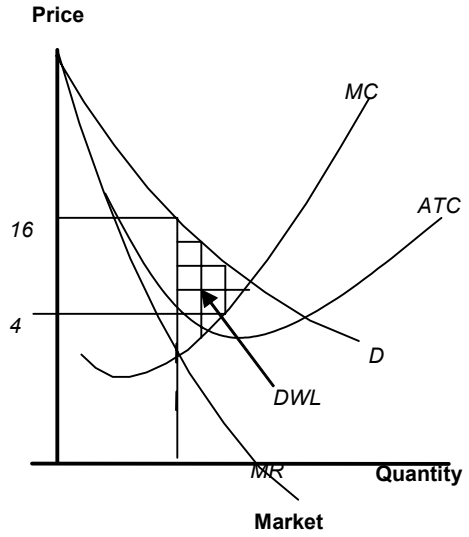
Quantity	Price	Total Revenue	Marginal Revenue	Marginal Cost
1	20	**20**	**20**	4
2	18	**36**	**16**	2
3	16	**48**	**12**	6
4	14	**56**	**8**	12
5	12	**60**	**4**	20
6	10	**60**	**0**	40
7	8	**56**	**-4**	80

a) What would be the profit maximizing quantity?
Q = 3

b) What would be the profit maximizing price?
P = 16

c) What would be the profit?
TR – TC = 48 – 12 = 36

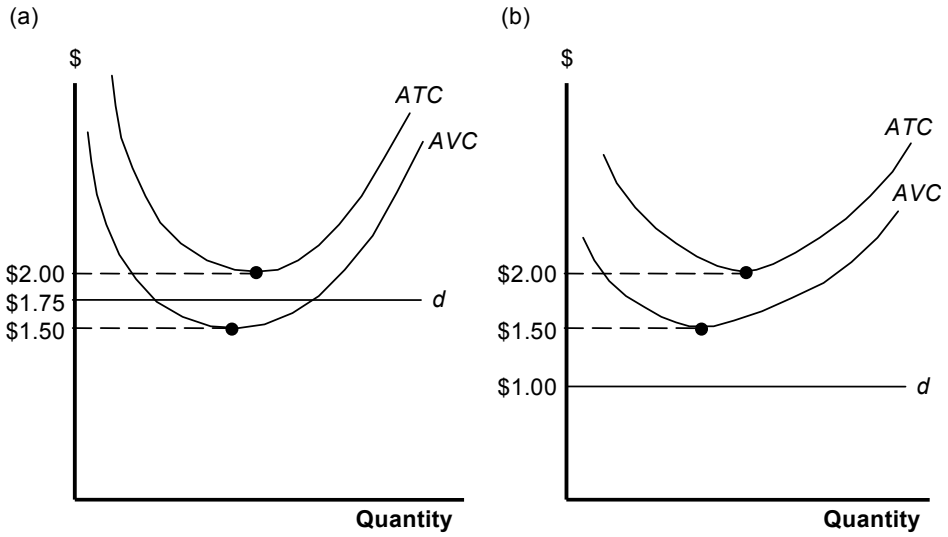
d) Draw the MC, D and MR - show the quantity, price, profit, and deadweight loss.



e) Explain why there is deadweight loss associated with the single-price monopolist?

To sell more output the firm has to lower the price for all units. Therefore, a monopolist wishes to restrict quantity and increase price (producing where MC = MR). Total surplus is not maximized in this case.

3. From your textbook Chapter 7 # 3 (page 227/228)



a. The firm stays open (since *P* > min *AVC*), produces where *MC* = $1.75, and earn negative profits in the short run (since *P* < *ATC*).

b. *The firm shuts down,* since *P* < min *AVC,* so *P* must be less than *AVC* at all output levels.

4. From your textbook Chapter 7 # 4 (page 228)

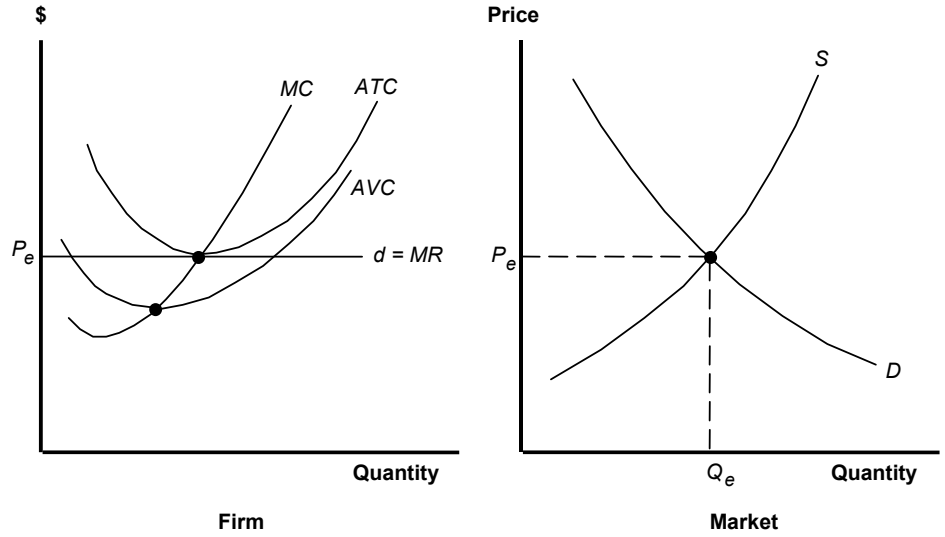
a. The market equilibrium price—where quantity supplied equals quantity demanded—is $2.00 per pound. Thus, each individual firm will face a price of $2.00, which is also its marginal revenue. From the total cost column, we can calculate that marginal cost is $1.00 per pound for increases from 60,000 to 61,000, and from 61,000 to 62,000. When output increases from 62,000 to 63,000, however, *MC* = $3.00. Since *MR* > *MC* for increases in output up to 62,000, but *MR* < *MC* beyond 62,000, the typical firm should produce 62,000 pounds.

b. At 62,000 pounds, *ATC* = *TC/Q* = $112,000/62,000 = $1.81. Since *P* > *ATC,* the firm is earning a profit. Profit will attract entry, so this market is not in long-run equilibrium.

c. The profit that the firm is earning will attract entry, so that the number of firms will increase.

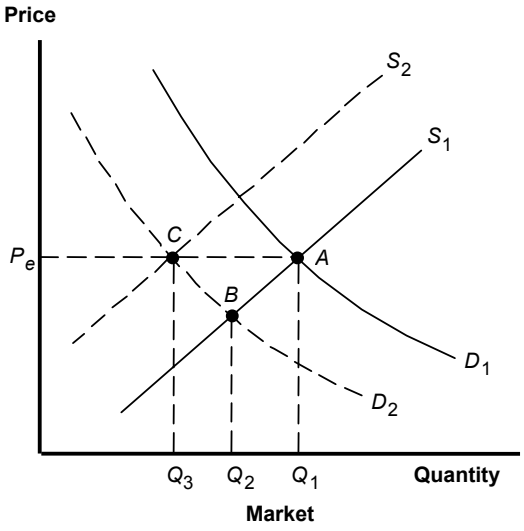
5. From your textbook Chapter 7 # 5 (page 228)

a.



b. Firms in the market are earning zero economic profit, so it *won't* be profitable to jump in.

c.



The market demand curve shifts leftward. In the short run, market supply falls along the short-run market supply curve, to Q_2. Over the long run, exit occurs and the supply curve shifts leftward. In the long run, price returns to its original level, and the market quantity of kitty litter decreases to Q_3, as shown in the new market diagram. At each firm, however, both price and quantity—and all of the cost curves—end up just as they were before the change in pet preference. [See diagram for the firm in (a).]

d. The market supply curve is more elastic in the long run. In the short run, a given change in price causes a relatively small change in quantity, as in the move from *A* to *B* in the market diagram.

This is because in the short run, the number of firms in the industry is fixed. In the long run, the quantity response is relatively larger, since new firms can enter or existing firms can exit.

6. From your textbook Chapter 7 # 6 (page 228)

Yes. In the short run, a higher price induces existing firms to produce more output, while in the long run, a higher price also induces entry.