Sample: Economics - Marginal Revenue Curve

Question 1:

An isolated farming town is cut in half by a highway, and each side of town has a supplier of fertilizer. John, one of the suppliers, learned that the other supplier, Joe, was planning to open a store on his side of town. John called Joe to arrange a meeting in which he threatened to open another store on Joe's side of town. Joe took the threat seriously and agreed with John that each would remain only on his side of town, thus basically setting up a market sharing cartel. Suppose that the total market demand for fertilizer in the farming town is Q = 120 - 10P, where Q is in pounds and P is in dollars. John and Joe face MC and ATC functions equal to MC = 0.2 and ATC = 0.1Q.

(a) Calculate the level of output, price and profit of each firm.

As demand is Q = 120 — 10P, P = 12 — Q/10.

Because marginal cost is the same for both firms and is constant for all output, we may determine the profit-maximizing output by considering only one firm, i.e., let $Q_1 = Q$ and $Q_2 = 0$.

If both firms enter the market, and they collude, they will face a marginal revenue curve with twice the slope of the demand curve (MR = TR' = (P*Q)' = (12Q — Q^2/10)' = 12 — Q/5), so MR = 12 — Q/5.

Setting marginal revenue equal to marginal cost to determine the profit-maximizing quantity, *Q*:

MR = MC,

12 — Q/5 = 0.2

60 — Q = 1

Q = 59 pounds

Substituting *Q* = 4 into the demand function to determine price (as the firms will set the price on the demand curve with their optimal quantity): *P* = 12 – 59/10 = $6.1

Total cartel profit will be TP = (P – ATC)*Q = (6.1 – 0.1Q)*Q = (6.1 – 0.1*59)*59 = 0.2*59 = $11.8

Because *MC* is constant, the firms may split quantities and profits. If they split quantity equally (as the parts of the town are equal), then *Q*1 = *Q*2 = 29.5 pounds and profits are $11,8/2 = $5.9 for each firm.

(b) Explain why this market sharing cartel reaches this solution. Is this realistic in the real world? Why?

The profits are small for the firms, but the existing of profit is good result for both, because without the cartel one of the firms or even both firms may face losses. Setting market cartel is realistic in the real world, but in the most countries setting cartels is illegal, because the firms don't compete with each other and set the best price and quantity for them, but not for the customers.

Question 2:

Dynamo is a monopoly provider of residential electricity in a region. Total demand by its 3 million households is QD = 1,500 - 2P and Dynamo can produce electricity at a constant marginal cost of $4 per megawatt-hour. Consumers in this region have recently complained that Dynamo is charging too much for its services. In fact, a few consumers are so upset that they are trying to form a coalition to lobby the local government to regulate the price Dynamo charges. If all the consumers of this region joined the coalition against Dynamo, how much would each consumer be willing to spend to lobby the local government to regulate Dynamo's price? Do you think consumers will be successful in their efforts? Explain.

Before the complaint Dynamo will produce Q in the point, where MR = MC. A marginal revenue curve is with twice the slope of the demand curve.

As Qd = 1,500 – 2P, P = 750 – Q/2

MR = 750 – Q

MR = MC, so 750 – Q = 4, Q = 746.

Substituting Q = 746 into the demand function to determine price: P = 750 – 746/2 = $377.

The optimal price and quantity without existing of the deadweight loss is in the point where MC = D, as it would be the competitive market equilibrium point (as in such market MR = MC = P = D).

As Qd = 1,500 – 2P, P = 750 – Q/2

MC = D, so MC = Pd,

4 = 750 – Q/2

Q/2 = 746

Q = 1492 megawatt-hour.

P = $4.

As we can see the price that each consumer will be willing to spend is much lower than the monopolist price, so it is almost impossible for them to be successful in their efforts. The main reason for this is that Dynamo is most likely to face losses with such low price and will not work at all. So, the government will need to compensate the losses to the monopolist (the sum of the compensation will be significant). So, the Dynamo will not decrease the price unless the government compensate losses.