Problem Set 10  Monopolies and Price Discrimination

1. What is the profit maximizing rule for a monopolist? Why does a monopolized industry produce at a different output level than if the same industry were competitive?

2. Draw a carefully labeled diagram with a market demand curve, marginal revenue curve, and monopolist MC curve. Indicate the quantity the monopolist will produce, the price they will charge, the consumer surplus, monopolist surplus, and deadweight loss.

   Why is there a deadweight loss?

3. Suppose that Company ABC has a monopoly over the supply of electricity to the town of Culbertson. It faces the following demand curve for electricity: \( Q_D = 200 - 4P \)

   a) Fill in the following table based on the demand function:

<table>
<thead>
<tr>
<th>Price</th>
<th>Total Revenue</th>
<th>Marginal revenue</th>
<th>Price</th>
<th>Total Revenue</th>
<th>Marginal Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>$50</td>
<td></td>
<td>25</td>
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<tr>
<td>45</td>
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<td>40</td>
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<td>35</td>
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<tr>
<td>30</td>
<td></td>
<td>5</td>
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</tr>
</tbody>
</table>

   b) If the firm’s marginal cost of producing a unit of electricity is $10, what is its profit maximizing output level? At that output level how much profit will the firm earn?

   c) If instead many firms supply electricity to Culbertson, what quantity of electricity would be supplied to consumers in that market? (Assume that marginal cost remains $10 per unit of electricity for all units supplied.)

   d) What happens to consumer welfare if the industry becomes competitive? (Give a number—you will need to add up consumer surplus using points on the demand curve.)

   e) Now suppose that the creation of a competitive industry increases the marginal cost of producing all units of electricity to $35 per unit, because “small” firms cannot achieve economies of scale in producing electricity (marginal cost is still only $10 if the industry remains a monopoly). How would the previous question (part c) change?

   f) Relate part (e) to the concept of a natural monopoly. What is a natural monopoly? When might allowing a natural monopoly be better for consumers than promoting a competitive industry?

4. Draw a carefully labeled graph showing the average cost function of a natural monopolist and the market demand they face. Assume that marginal costs are constant and equal to zero. Indicate the monopolist’s price and quantity produced.
5. Which of the following factors is likely to lead to greater market power?
   a. legally enforced patent rights
   b. Elastic demand for a product
   c. Requirement to have a license to enter the industry
   d. Control over a natural resource
   e. An increase in market demand

6. The Taos Pueblo is an ancient American Indian community in New Mexico that admits tourists. The admission fee is $5 per car plus $5 per camera.
   a. Give an explanation for this based on price discrimination.
   b. Give an explanation for this that is NOT based on price discrimination.
   c. Which of your explanations do you believe? What evidence would help you decide between your two theories?

7. Federal Express offers two kinds of overnight delivery. There is priority overnight, which is guaranteed to reach its destination by 10:30 the next day, and standard overnight, which is guaranteed to be delivered by 3 pm the next day. Priority costs 20% more than standard. Federal Express will often make 2 delivery trips to the same office in the same day just to avoid delivering the standard overnight packages before 10:30. How can you explain this behavior?