ECON 301
Intermediate Microeconomics
Spring 2007

Problem set #10: elements of answers

1. A monopolist sells in two states and practices price discrimination by charging separate prices in each state. The monopolist produces at constant marginal cost $MC = 10$. Demand in market 1 is $Q_1 = 50 - p_1$. Market 2 demand is $Q_2 = 90 - 1.5p_2$. What price will be charged in each market?

To get the profit maximizing output and price levels, set marginal cost equal to marginal revenue in each market and solve.

$$MR_1 = 50 - 2Q_1 = MC = 10$$
$$Q_{1m} = 20 \text{ and } p_{1m} = 30$$

$$MR_2 = 60 - 1.33Q_2 = MC = 10$$
$$Q_{2m} = \frac{75}{2} = 37.5 \text{ and } p_{2m} = 35$$

2. Perloff, fourth edition: question 1 page 415

In order to price discriminate, Alexx must have market power - the ability to set prices. Consumers must have varying price sensitivities, and Alexx must be able to identify individual consumers or groups of individuals based on willingness to pay. Alexx must also be able to prevent reselling after the initial sale.

3. Perloff, fourth edition: question 8 page 415

If Amazon can effectively monitor individual customer’s shopping pattern and history and offer different price accordingly, this is essentially first-degree price discrimination.

4. Perloff, fourth edition: question 16 page 416

See Figure 1. Output expands, as do profit and consumer surplus. When the markets are combined, the monopolist sells $Q_2^*$ for $5$, to all consumers in market 2. When the markets can be separated, price and quantity remain unchanged in market 2, but the monopolist also sells $Q_1^*$ for $p_1$. 
5. Perloff, fourth edition: problem 31 page 418
Setting marginal revenue equal to marginal cost yields $Q^* = 30$, $p^* = 60$. Profit is $900$, consumer surplus is $450$, welfare is $1350$, and $DWL$ is $450$.

6. Perloff, fourth edition: problem 34 page 418
Using equation 12.2,
\[ p_{us}(1 - 1/2) = 10 = p_j(1 - 1/5) \]
\[ p_{us} = 20 \]
\[ p_j = 12.5 \]

Set marginal revenue in each market equal to marginal cost to determine the quantities. Plug the quantities into the demand functions to determine prices.
\[ MR_1 = 100 - 2Q_1 = 30 = MC \]
\[ MR_2 = 120 - 4Q_2 = 30 = MC \]
\[ Q_1 = 35 \]
\[ p_1 = 65 \]
\[ Q_2 = 22.5 \]
\[ p_2 = 75 \]