Intermediate Microeconomics

Problem Set 3
(Due Date: Nov. 28)

1. Why is there a social cost to monopoly power? If the gain to producers from monopoly power could be redistributed to consumers, would the social cost of monopoly power be eliminated? Explain briefly.

2. A monopolistic firm faces the following average revenue (demand) curve: $P = 100 – 0.01Q$ where Q is weekly production and P is price, measured in cents per unit. The firm's cost function is given by $C = 50Q+30000$.
   A) What is the level of production, price, and total profit per week?
   B) The government decides to levy a tax of 10 cents per unit on this product. What will the new level of production, price, and profit be as a result?
   C) Assume that the monopoly has the ability to implement first-degree price discrimination. What will the new level of production, price and profit be as a result?
   D) Calculate the consumer surplus and producer surplus in (A) (B) and (C). Is the total social welfare increase or decrease with the implementation of tax? (note: tax revenue is part of social welfare). Is the total social welfare increase or decrease with first-degree price discrimination?

3. A monopolistic firm has two factories, for which costs are given by:

   Factory #1: $C_1(Q_1) = 10Q_1^2$
   Factory #2: $C_2(Q_2) = 20Q_2^2$

   The firm faces the following demand curve: $P = 700 – 5Q$, where Q is total output ($Q=Q_1+Q_2$).
   A) Calculate the values of Q_1, Q_2, Q, and P that maximize profits. Also draw a diagram to illustrate the optimal choices of this firm.
   B) Suppose labor costs increase in Factory 1 but not in Factory 2. How should the firm adjust Q_1, Q_2, Q, and P?

4. Suppose that a monopoly can produce any level of output it wishes at a constant marginal cost $5 per unit. Assume that the monopoly sells its goods in two different markets that are separated by some distance. The demand curve in the first market is given by Q1=55-P1, and the demand curve in the second market is given by Q2=70-2P2.

   A) If the monopolist can maintain the separation between the two markets, what level of output should be produced in each market, and what price will prevail in each market? What are total profits in this situation?

B) How would your answer change if it only costs demanders $5 to transport goods between the two markets? What would be the monopolist's new profits in this situation?
C) How would your answer change if transportation costs were zero and the firm was forced to follow s single-price policy?
D) Suppose the firm could adopt a linear two-part tariff under which marginal prices must be equal in the two markets but lump-sum entry fees might vary. What pricing policy should the firm follow?

5. You are selling two goods, 1 and 2, to a market consisting of three consumers with reservation prices as follows

Consumer	For 1	For 2
A	20	40
B	30	60
C	40	80

The unit cost of each product is $30.

A) Compute the ***optimal*** prices and profits for (i) selling the goods separately, (ii) bundling. Which strategy would be most profitable? Why?

Assume now that you are facing four consumers with the following reservation prices

Consumer	For 1	For 2
A	25	100
B	40	80
C	80	40
D	100	25

B) Compute the ***optimal*** prices and profits for (i) selling the goods separately, (ii) bundling. Which strategy would be most profitable? Why?