Intermediate Microeconomics

Problem Set 3
(Due Date: April 30)

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. 考虑一个垄断企业，它面临的需求曲线为 $p = 200 - 2Q$,边际成本为固定的80元。

1） 请画出该企业的需求曲线和边际收益曲线，并求出利润最大化的价格和产量。

2） 现假定政府颁布了限价令，规定最高价为100元。请画出限价令下企业的边际收益曲线。

3） 当限价为100元时企业最优的价格和产量为多少？如果政府规定最高价为160元，此时企业利润最大化的价格和产量为多少？

4） 帕累托最优的产量应该为多少？是否存在一个限价让垄断企业愿意生产社会最优的产量的限价？

5．假定一个垄断企业的成本函数为$TC(x)=x$，它面临两类消费者（各占50%的比例）A和B，A类消费者的效用函数为$U^A(x,y)=5x-0.5x^2+y$，B类消费者的效应函数为$U^B(x,y)=6x-0.5x^2+y$，其中x代表垄断厂商生产的商品，y代表消费者消费的其他商品组合。

1） 消费者A和B的效用函数形式有何特征？求出A和B两类消费者的需求函数，你可以假定其他商品组合y的价格为1。

2） 如果垄断厂商采取两部分定价（two-part tariff）的方式销售，而且只能选择其中一类消费者进行销售，那么，你认为它会选择哪一类消费者？它将如何确定最优的一次性支付M和边际价格？

3） 如果垄断厂商必须同时服务两类消费者，统一采取两部分定价的方式，此时最优的M和边际价格为多少？

6. 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?