

Intermediate Microeconomics
Fall 2002
Assignment 9

Due Date: Monday, November 25

Be sure to show all of your work and clearly indicate your final response to each question. For exercises from the workbook you can hand in the completed workbook pages or provide the answers on separate sheets of paper. Please be sure that your homework is stapled before handing it in.

1. A monopolistic firm faces a demand function for its output given by $q = 50 - p$. The firm produces its output at two plants, A and B . The cost of producing output at plant A is

$$C_A(q_A) = 4q_A + .5q_A^2$$

while the cost of producing output at plant B is

$$C_B(q_B) = q_B + q_B^2.$$

The output produced by the plants is indistinguishable, so that total firm production is simply $q = q_A + q_B$.

- (a) How much output should the firm produce in order to maximize profits?
 - (b) How should output be divided between the two plants?
2. A monopolistic firm sells its output in two distinct markets, A and B . The demand for its output in the respective markets is

$$\begin{aligned}q_A &= 20 - 5p_A \\q_B &= 10 - p_B,\end{aligned}$$

where q_i is the demand in the i^{th} market and p_i is the price charged in the i^{th} market [the markets are perfectly separated]. If the firm's cost function is given by

$$C(q) = 2 + q + .5q^2,$$

what are the profit-maximizing quantities sold in each market?

3. A monopolistic firm faces a demand function for its output given by $q^D = 40 - p$. If its cost function is given by $C(q) = 5q$, how much would it pay for the ability to be able to "perfectly" price discriminate instead of charging all customers the same price?
4. WIM 25.4
5. WIM 25.5

6. Two firms with identical constant marginal costs of production equal to 2 share an output market in which demand is given by $q(p) = 100 - 2p$. Determine the profits of each firm when:
- (a) they act as Cournot competitors
 - (b) they act as Bertrand competitors
 - (c) they act as a single monopolist and split the industry profits evenly.
7. Consider the two firms referred to in the previous problem and the case in which Cournot competition prevails. Prior to the competition [which lasts only one period], firm 1 is offered the chance to lower its constant marginal cost of production from 2 to 1 by installing a new technology. If the cost of the technology is 20, should firm 1 purchase it?