

Microeconomics II

Homework 4

Question 1.

A monopoly faces an inverse demand curve, $p(y) = 100 - 2y$, and has constant marginal costs of 20.

- (a) What is its profit-maximizing level of output?
- (b) What is its profit-maximizing price? \$
- (c) What is the socially optimal price for this firm?
- (d) What is the socially optimal level of output for this firm?
- (e) What is the deadweight loss due to the monopolistic behavior of this firm?
- (f) Suppose this monopolist could operate as a perfectly discriminating monopolist and sell each unit of output at the highest price it would fetch. What is the deadweight loss? What is the total social surplus and how is it distributed?

Question 2.

Banana Computer Company sells Banana computers both in the domestic and foreign markets. Because of differences in the power supplies, a Banana purchased in one market cannot be used in the other market. The demand and marginal revenue curves associated with the two markets are as follows: $P_d = 20,000 - 20Q$; $P_f = 25,000 - 50Q$; $MR_d = 20,000 - 40Q$ and $MR_f = 25,000 - 100Q$. Banana's production process exhibits constant returns to scale and it takes \$1,000,000 to produce 100 computers. Fixed costs are zero.

- (a) Write down the total average cost and marginal cost functions.
- (b) How much computers and at what price should Banana sell in the domestic market?
- (c) How much computers and at what price should Banana sell in the foreign market?
- (d) What are Banana's total profits?
- (e) At the profit-maximizing price and quantity, what is the price elasticity of demand in the domestic market?
- (f) What is the price elasticity of demand in the foreign market?
- (g) Is demand more or less elastic in the market where the higher price is charged?

Question 3.

The Grand Theater is a movie house in a medium-sized college town. If the theater is open, the owners have to pay a fixed nightly amount of \$500 for films, ushers, and so on, regardless of how many people come to the movie. For simplicity, assume that if the theater

is closed, its costs are zero. The nightly demand for Grand Theater movies by students is $Q_S = 220 - 40P_S$, where Q_S is the number of movie tickets demanded by students at price P_S . The nightly demand for nonstudent moviegoers is $Q_N = 140 - 20P_N$.

If the Grand Theater charges a single price, P_T , to everybody, then at prices between 0 and \$5.50, the aggregate demand function for movie tickets is $Q_T(P_T) = 360 - 60P_T$. Over this range of prices, the inverse demand function is then $P_T(Q_T) = 6 - Q_T/60$.

- (a) What is the profit-maximizing number of tickets for the Grand Theater to sell if it charges one price to everybody?
- (b) At what price would this number of tickets be sold?
- (c) How much profits would the Grand make?
- (d) How many tickets would be sold to students and to nonstudents?
- (e) Suppose that the cashier can accurately separate the students from the nonstudents at the door by making students show their school ID cards. Students cannot resell their tickets and nonstudents do not have access to student ID cards. Then the Grand can increase its profits by charging students and nonstudents different prices. What price will be charged to students? \$
- (f) How many student tickets will be sold?
- (g) What price will be charged to nonstudents?
- (h) How many nonstudent tickets will be sold?
- (i) How much profit will the Grand Theater make?