73230 Intermediate Microeconomics
Problem Set 4

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Due: In-class at 10:30am on May 1st, 2019

Problem 1 (60 pts) - Monopoly

Amazon is a monopolist in the textbook market. Amazon is currently selling textbooks only in the US. The demand for textbook is given by:

$$P = 210 - Q$$

The marginal cost of producing textbook is $MC = 5$. there is no fixed cost.

(a) (5 pts) Compute the profit-maximizing price and quantity.

(b) (5 pts) Compute the deadweight loss due to monopoly power.

(c) (10 pts) If Amazon can use first-degree price discrimination, what is its profit? Is there any deadweight loss?

(d) Suppose that Amazon is deciding whether to also sell textbooks in Wakanda. The demand for textbook in Wakanda is given by:

$$P = 70 - Q$$

(i) (10 pts) If Amazon can price discriminate between US and Wakanda, what are the optimal prices and quantities?

(ii) (10 pts) If Amazon cannot price discriminate between US and Wakanda, what are the optimal price and quantities?

(iii) (5 pts) Using your answers in (i) and (ii), which country is better off with price discrimination? Which country is worse off?

(iv) (10 pts) How would your answer to (i) change if the cost function is given by $TC(Q) = 0.5Q^2$?

(e) (5 pts) Give an example of second-degree price discrimination.

Problem 2 (20 pts) - Cournot and Stackelberg Competitions

Consider a market in which two firms are producing a homogenous good and competing by simultaneously choosing quantities (i.e., in Cournot style). The market demand is given by

$$P = 20 - Q$$

The marginal cost of both firms are $MC_1 = MC_2 = 2$.

(a) (5 pts) Derive firm 1's best response to firm 2's quantity choice, i.e., $q_1(q_2)$.

(b) (5 pts) What are the equilibrium price and quantities? Compute the deadweight loss.

(c) (10 pts) Suppose now that firm 1 has a first-mover advantage. That is, firm 1 chooses q_1 first, and then firm 2 chooses q_2. Compute the equilibrium price and quantities in this case. What is the deadweight loss?

Problem 3 (20 pts) - Bertrand Competition

Whole Foods and Trader Joes are both selling organic apples. Both stores compete by simulatenously choosing prices (i.e., in Bertrand style). Let MC_{WF} and MC_{TJ} be the marginal costs of Whole Foods and Trader Joes, respectively.

(a) (10 pts) What are the equilibrium prices if $MC_{WF} = MC_{TJ} = 3$?

(b) (10 pts) If $MC_{WF} = 4$ and $MC_{TJ} = 2$, what are the equilibrium prices?