Price Discrimination: Exercises Part 2

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Problem 1

An economics journal is considering offering a new service which will send articles to readers by email. There are two types of potential users, students and professors. Let x denote the number of articles requested by a user. The professors have an inverse demand function $p_1(x) = 100 - x$ and the students have an inverse demand $p_2(x) = 80 - x$. The marginal cost of sending articles to users is zero.

(a) Draw the demand functions.

(b) Suppose that the journal can identify the type of use (professor or student). It decides to offer a plan where users can buy a fixed number of articles for a fixed price. What price-quantity combination will the journal offer to each type of user?

(c) Now suppose that the journal cannot observe which type any given user is. The journal continues to offer two packages. Suppose that it offers one package which allows up to 80 articles (intended for students) and one package that allows up to 100 articles (intended for professors). What is the highest price that students will be willing to pay for the 80-article package? What is the highest price that the journal can charge for the 100-article package if it offers the 80-article packages at the highest price the students are willing to pay? In this situation, what is the consumer surplus obtained by a professor?

(d) Suppose now that the journal decides to restrict the number of articles in the package intended for the students to 60. What is the most the journal could charge for a 60-article package and still get the students to buy it? How much consumer surplus would the professors get from buying this 60-article package? What is now the most the journal could charge for the 100-article package and still get the professors to choose this package?

(e) Suppose that there is an equal number of students and professors in the population. Would the journal make larger profits by offering the 80-article or the 60-article package to the students?

Problem 2

A software company is selling two products: product A (a wordprocessor) and product B (a spreadsheet). The boss of the company is contemplating a marketing strategy that involves bundling the two products together and selling the pair of software products for one price.

Suppose that, at present, the company is selling product A at a price of £200 and it is selling product B at a price of £250. A survey of 100 people who purchased either of these products last year showed that there were three groups of customers.

1. 20 people bought both.

2. 40 people bought only product A; they would have been willing to pay up to £120 for product B.

3. 40 people bought only product B; they would have been willing to pay up to £100 for product A.

Assume that new customers have the same characteristics as the surveyed group. Assume also that the marginal cost of producing extra copies of either product is zero; similarly, the marginal cost of creating a bundle is zero.

(a) Assume that the company offers the products separately as well as bundled. What is the highest price that the company can set for the bundle and still induce group 2 (the word-processor users) to buy it? What is the highest price that the company can set for the bundle and still induce group 3 (the spreadsheet users) to buy it?

(b) What would be the company's profits on a group of 100 users if it priced the bundle at £320? What would be the company's profits on a group of 100 users it priced the bundle at £350? If the company were to offer the bundle, what price should it set?

(c) What would profits be without offering a bundle? Should the bundle be offered?

(d) Suppose that the company worries about the reliability of the survey. It is clear that there are three groups with the above characteristics. However, the company believes that, out of 100 people, t are of type 1 while $(100 - t)/2$ are of type 2 and $(100 - t)/2$ are to type 3. Calculate profits as a function of t assuming that the firm does not bundle. What are profits with the bundle? At what values of t would be be unprofitable to offer the bundle?