Microeconomics for Management - Yossi Spiegel

Problem set 5

Problem 1

Ruth's income is $200 and she likes to go on occasion to a swimming pool. Her utility function is given by

$$U(x,m) = 20x - \frac{x^2}{2} + m,$$

where x is the number of visits to the swimming pool and m is Ruth's expenditure on all other goods.

(a)   How many times will Ruth go to the swimming pool if the price is $10 per visit?

(b)   Suppose that in order to visit the swimming pool Ruth also needs to buy a membership card. What is the maximal amount that Ruth would be willing to pay for a membership card if the cost per visit remains $10?

(c)   Now suppose that the management of the swimming pool considers raising the cost of a membership card and allow members to visit the swimming pool as many times as they wish at no additional cost. What is the maximum amount that Ruth will be willing to pay now for a membership card?

(d)   Which plan (the one in (b) or the one in (c)) generates a higher revenue for the swimming pool?

Problem 2

David's preferences over telephone calls and all other goods is given by $8(1+q)^{1/2} + m$, where q is the number of hours that David uses the telephone and m is David's expenditure on all other goods. The price of telephone calls is p per hour.

(a)   Compute David's demand function for telephone calls.

(b)   Compute David's consumer surplus when he makes q calls at a price of p per call.

(c) Suppose David's telephone company wanted to induce him to use the telephone for 3 hours. What should p be?

(d) Given your answer to (c), what is the largest amount that David will agree to pay to the telephone company as a fixed charge (without this fixed charge he cannot use the telephone at all)?

(e) Now suppose that the telephone company offers David the following deal: for a price of T he can use the telephone for 3 hours. If this was the only deal that was offered to David (the alternative would be not to use the telephone at all), what would be the highest T that he would agree to pay?