Microeconomics for Management - Yossi Spiegel

Problem set 4

Problem 1

Joe spends his entire income on apples and bananas. Here is information about his consumption in the years 1999, 2000, and 2001 and the prices of apples, p_a, and bananas, p_b, in these years.

year	quantity of apples	p_a	quantity of bananas	p_b
1999	3	20	6	10
2000	8	10	2	35
2001	5	20	5	20

(a)   Using the information in the table, can you tell whether Joe was better-off in 2000 than he was in 1999? In 2001 than he was in 1999? In 2001 than he was in 2000?

(b)   How would your answer change if Joe's consumption in 2000 was 16 apples and 4 bananas?

Problem 2

Ruth consumes only two goods, 1 and 2. Her utility function is given by $U = x_1 x_2$, where x_1 is the quantity of good 1 that she consumes and x_2 is the quantity of good 2 that she consumes. Ruth's income is I and the prices of the two goods are p_1 and p_2.

(a)   Suppose that the government imposes a per unit tax t on good 1 (the price of the good from Ruth's point of view is therefore $p_1 + t$). Compute Ruth's optimal consumption bundle given the tax (hint: you need to maximize Ruth's utility function subject to her budget constraint).

(b)   Using your answer in (a), compute the tax revenue that the government raises from Ruth.

(c)   Now suppose that instead of imposing a per unit tax t on good 1, the government imposes an income tax, R, on Ruth, such that R is equal to the tax revenue that you computed in

b. Compute Ruth's optimal consumption bundle given the income tax R.

(d)   Compare Ruth's utility in (a) and (c). Which kind of tax would she prefer? Explain your answer in detail and pay special attention to the intuition for your answer. To provide an intuition for your answer, draw a graph that shows Ruth's budget constraint in the (x_1, x_2) space given a per unit tax t and given an income tax R and show Ruth's optimal bundle in each case (hint: where do the two budget constraints cross? Why is that?).

Problem 3

Mary has an endowment of 3 units of good 1 and 6 units of good 2 which she can either consume or sell. The prices of the two goods are $p_1 = 4$ and $p_2 = 1$ (the prices are the same whether Mary buys or sells). Mary has no additional income apart from her endowment.

(a)   Write down Mary's budget constraint and draw it in the (x_1, x_2) space.

(b)   Suppose that p_2 increase from 1 to 2. Draw the new budget constraint. Can you tell if Mary is better-off or worse-off as a result of the price increase? If you cannot tell, which information do you need to know to provide an answer (explain why)?

(c)   Assume that Mary's utility function is given by $Min\{x_1, x_2\}$. Can you tell if the increase in p_2 from 1 to 2 makes Mary better-off or worse-off? Explain your answer.

(d)   Repeat your answer to (c) assuming now that Mary's utility function is given by $Min\{x_1/3, x_2\}$.