

Paris School of Economics, M1 APE

Microeconomics 1, Problem Set 2

Michaelmas Term 2007-2008

Exercise 1

Let us consider a consumer in a two-good economy. His consumptions of goods 1 and 2 are denoted x_1 and x_2 respectively. His tastes are represented by a preference relation \succsim defined over the consumption vectors $(x_1, x_2) \in \mathbb{R}_+ \times \mathbb{R}_+$. The indifference relation associated with \succsim is denoted \sim . The following assumptions are made:

- A1. \succsim is complete;
 - A2. $(\tilde{x}_1, 0) \succsim (x_1, 0)$ if and only if $\tilde{x}_1 \geq x_1$;
 - A3. all indifference curves are linear in the (x_1, x_2) -space. The indifference curve through $(\tilde{x}_1, 0)$ as equation $x_1 + 2x_2\sqrt{\tilde{x}_1} = \tilde{x}_1$.
1. Construct a utility function which represents the consumer's preferences.
 2. Compute the marginal rate of substitution of good 1 for good 2.

Exercise 2

In a three commodity world, consider the three budget sets determined by the price vectors

$$\begin{aligned} p^1 &= (2, 1, 2), \\ p^2 &= (2, 2, 1), \\ p^3 &= (1, 2, 2), \end{aligned}$$

and wealth $w = 8$ (the same for the three budgets). Suppose that the respective (unique) choices are

$$\begin{aligned} x_1 &= (1, 2, 2), \\ x_2 &= (2, 1, 2), \\ x_3 &= (2, 2, 1). \end{aligned}$$

1. Verify that any two pairs of choices satisfy the weak axiom but that x^3 is revealed preferred to x^2 , x^2 to x^1 and x^1 to x^3 .
2. Comment.

Exercise 3

You are given the following partial information about a consumer's purchases. He consumes only two goods:

	Year 1		Year 2	
	Quantity	Price	Quantity	Price
Good 1	100	100	120	100
Good 2	100	100	?	80

Over which range of quantities of good 2 consumed in year 2 would you conclude:

1. that the consumer's consumption bundle in year 1 is revealed preferred to that in year 2?
2. that the consumer's consumption bundle in year 2 is revealed preferred to that in year 1?
3. that his behaviour is inconsistent, i.e. in contradiction with the weak axiom?
4. that there is insufficient information to justify (1), (2), and/or (3).

Exercise 4

A consumer whose wealth is w can buy two goods in quantities x_1 and x_2 respectively. The price of the first good is $p_1 = 3$, that of the second one is $p_2 = 2$. The preferences of the consumer are represented by the utility function

$$U(x_1, x_2) = (x_1 + 4)(x_1 + x_2).$$

1. Draw the indifference curves in the Cartesian space.
2. Write down and solve the optimization programme of the consumer.
3. For each good, draw the Engel curve. Interpretation?

Exercise 5

An individual consumes commodities $1, \dots, L$ in quantities x_1, \dots, x_L . Given this consumer's income w let $x_l^*(p, w)$ be his Marshallian demand functions, $l = 1, \dots, L$.

Is it then correct to conclude that if all income elasticities of these demands are equal they are necessarily unitary? Explain your answer.