

CHOICE AND DEMAND

Problem #1

Let's analyze the choice between two goods – good 1 and good 2. Assume that initially their prices are $p_1 = p_2 = 1$ and the disposable income is 1000.

We will analyze the changes in demand for these goods for four persons whose preferences are the following:

Person	Utility function
A	$U = X_1^{0.5} X_2^{0.5}$
B	$U = \min\{2X_1, X_2\}$
C	$U = 2X_1 + 3X_2$
D	$U = 100X_1 + X_2 - X_1^2/2$

- Find the demand functions for goods 1 and 2 for each of these persons, depending on prices p_1 and p_2 as well as income M .
- Knowing the demand functions for these persons, demonstrate the effects of the change in the price of good 1. Fill in the table below for every person and graph the hypothetical demand functions.

Price p_1	X_1	X_2	$p_1 * X_1 / M$ Percentage share of expenses for X_1	$p_2 * X_2 / M$ Percentage share of expenses for X_2
$p_1 = 1$ (initial situation)				
$p_1 = 5$				
$p_1 = 10$				

- Knowing the demand functions for these persons determine the consequences of changing the disposable income (M). Fill in the table below and graph the hypothetical Engel curves.

Income	X_1	X_2	$p_1 * X_1 / M$ Percentage share of expenses for X_1	$p_2 * X_2 / M$ Percentage share of expenses for X_2
$M = 1000$ (initial situation)				
$M = 500$				
$M = 100$				

- On the basis of these examples describe the transmission between the utility function and the demand function.

Problem #2

On the basis of a consumer's choices, as given below, define a utility function that fits well his preferences.

p_1	p_2	X_1	X_2	M
1	1	40	160	200
2	1	50	400	500
1	3	90	120	450

Problem #3

The Smiths and the Blacks are the only consumers of a certain washing detergent (x) and a certain softening liquid (y). Both products are sold in small packages which cost 1 USD for a package of x and 2 USD for a package of y . The Smiths' preferences are reflected by the function $U = x + 5y$, while for the Blacks they are given by the formula $U = 2x + y$.

- Determine the market demand for the washing detergent and liquid if each of the families has a disposable income of 50 USD.
- Present the market demand function for the washing detergent assuming the income level and price of liquid as given above.