2009

ECONOMICS
DEPARTMENT

OCTAVIAN JULA

MICROECONOMICS SEMINAR – WORKING PAPERS – OCTAVIAN JULA

First seminar – English line of Study 2009-2010 October 2009

SOME MATHEMATICAL TOOLS USED IN MICROECONONOMICS

Variation index: $I_x = \dfrac{X_1}{X_0} \cdot 100$

Relative variation: $I_x = \dfrac{X_1}{X_0} \cdot 100 - 100 = \dfrac{\Delta X}{X_0} \cdot 100$

Absolute variation: $\Delta X = X_1 - X_0$

if $X_1 > X_0$ (so $I_X > 1$) => **increase**
     $X_1 = X_0$ (so $I_X = 1$) => **constant**
     $X_1 < X_0$ (so $I_X < 1$) => **decrease**

Example:
The nominal salary of an employee was at the beginning of the year 500 euro. On 31st of august the salary was 550 euro.

So, $I_{Si} = \dfrac{550}{500} = 1{,}1$

This can be expressed in 3 different ways, but with the same meaning
- *The salary increased by **1,1 times** (coefficient of variation)*
- *The salary increased **at 110%** (variation index)*
- *The salary increased **with 10%** (relative variation)*

So:
- *The salary increased with **50 euro** (absolute variation)*

  1.   Same absolute variation determines different relative variations, depending on if there is and increase or a decrease.
Example:
To the same absolute variation – let's say 250 units – will correspond an relative increase by 25% (for example, from 1000 to 1250 units), and a decrease by only 20% (for a reduction from 1250 to 1000 de units).

- *Increase:* $I_C = \dfrac{1250}{1000} 100 - 100 = 25\,\%$

- *Decrease:* $I_S = \dfrac{1000}{1250} 100 - 100 = -20\,\%$

2. Consequent relative variations will not be summed in order to get the final relative variation for a wider period of time. The final relative variation can be determined as product from variation coefficients from those successive periods:

$$I_\Sigma = \prod I_i$$
$$I_\Sigma = (\prod I_i) * 100$$
$$I_\Sigma = (\prod I_i) * 100 - 100$$

Example:

An increase with 20 % is followed by an increase with 30% so the total growth will not be 50% (30%+50%), but 56% (1,2*1,3*100-100) because the second increase of 30% is calculated also at the initial increase.

- *Absolute total increase: (100*1,2)*1,3=120*1,3=156*
- *Relative total increase:* $I_C = \dfrac{156}{100} 100 - 100 = 56\,\%$

3. Other calculus relations:

$$\textbf{Arithmetical average:} \quad \overline{m} = \frac{\displaystyle\sum_{1}^{n} x_i}{n}$$

$$\textbf{Growth:} \quad p = \frac{x_i}{\sum x_i} 100$$

$$\textbf{Arithmetical average with growth:} \quad \overline{m} = \frac{\sum x_i p_i}{\sum p_i}$$

INTRODUCTION AND UNSOLVED "MISTERIES"

SOLVE THE NEXT EXAMPLES:

1. Establish the relations between the increase and the decrease from the table below:

A relative increase with	Is correspondent to a decrease with	A relative increase with	Is correspondent to a decrease with
1%	%	50%	%

2%	%	100%	%
3%	%	200%	%
10%	%	300%	%
25%	%	500%	%
33,3%	%	900%	%

2. Establish the relations between the increase and the decrease from the table below:

| A relative increase with	Is correspondent to a decrease with	A relative increase with	Is correspondent to a decrease with
1%	%	20%	%
2%	%	25%	%
3%	%	50%	%
10%	%	100%	%

3. The government decided to index the salaries as follows: from 1st of January with 8% and from 1st of October with 12%. What was the total increase in that year?

4. The monthly inflation rate was 1% in January, 1% in February and 1% in March. What is the total increase in the first three months of the year?

5. A decrease of the production in a certain period by 10% is followed by a next decrease with 20%. What is the total decrease of the production from the initial moment?

6. An increase with 60% is followed by a decrease with 40%. What is the evolution of the production?

7. An increase with 20% is followed by a decrease with 20% what is the evolution that will result from these elements?

8. The evolution of a certain price was:

t_1	t_2	t_3	t_4	t_5	t_6
+10%	-10%	+10%	+20%	+15%	-10%

What is the result of this evolution?

9. Represent graphically the next figures:

X	1	2	3	4	5	6	7	8
Y_1	10	35	55	70	80	85	85	75
Y_2	80	70	60	50	40	30	20	10
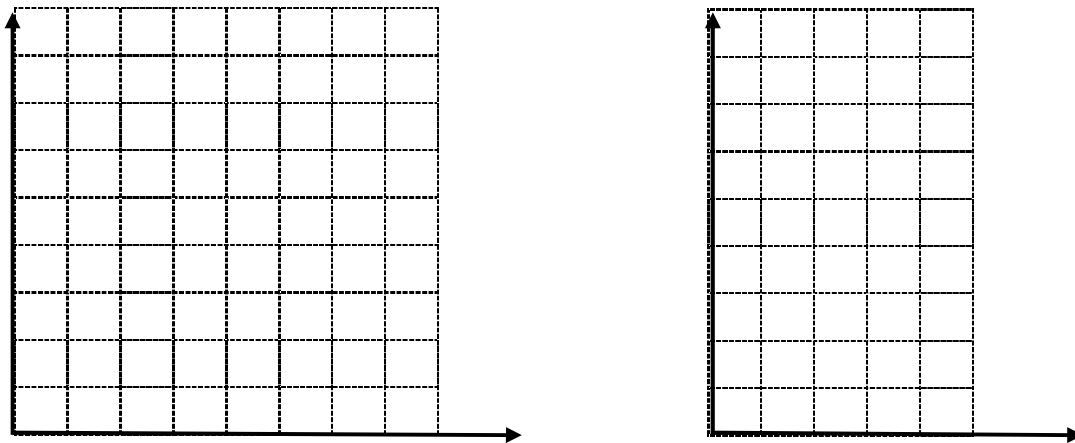
10. Represent graphically the function: $y = 6 - 2x$. Establish the relation between those two variables.
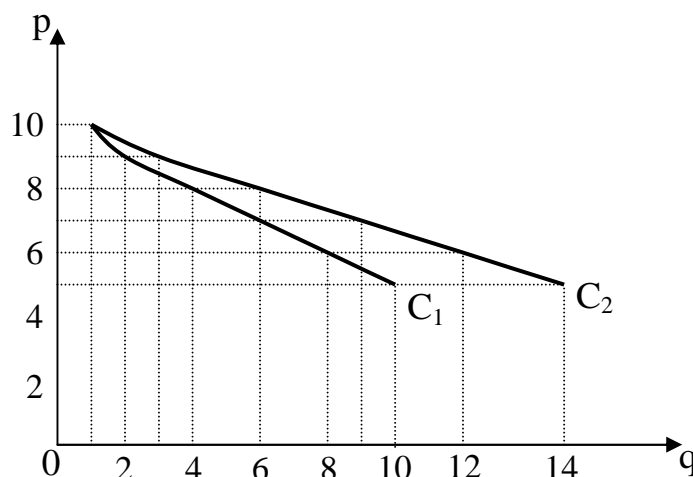
11. Read the data from the next graph and interpret them:
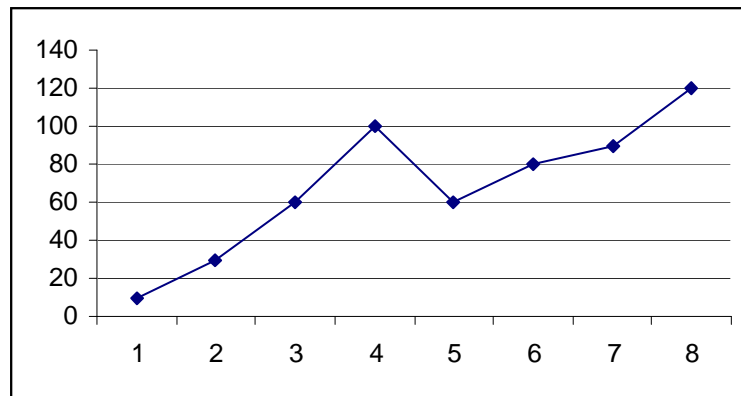
X	1	2	3	4	5	6	7	8
Y								

   A) What will be the change for Y (absolute and relative value) in $X = 4$ in respect with $X = 3$?
   B) What about $X = 5$ towards $X = 4$?

12. Explain from the next graph the data regarding the demands from a certain product coming from 2 households (C_1 and C_2) and present them into a table:

*Find the total demand.

13. Find the weight of each in the final price of gasoline:

	lei	*%*
Production cost	1,05	
Profit	0,21	
Road tax	0,35	
Luxury tax	1,31	
Special tax	0,02	
VAT	0,56	
Total		100

WEDNESDAY, OCTOBER 07, 2009

ACTIVTY, NEEDS AND INTERESTS

PROBLEMS TO BE DISCUSSED:

1. Analyze:

A)

| NEED | → | DESIRE | → | ACTION |

search

GOOD ┈┈ *identification*

B)

Self-esteemed

Status in the society

Affiliation

Security needs

Biological needs
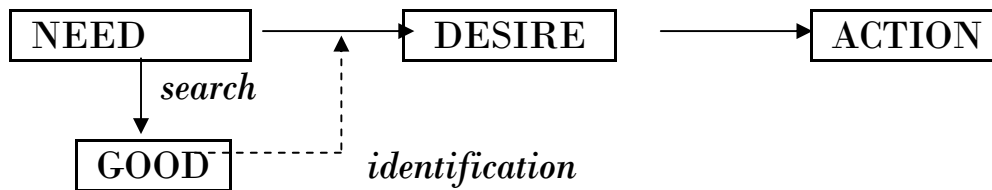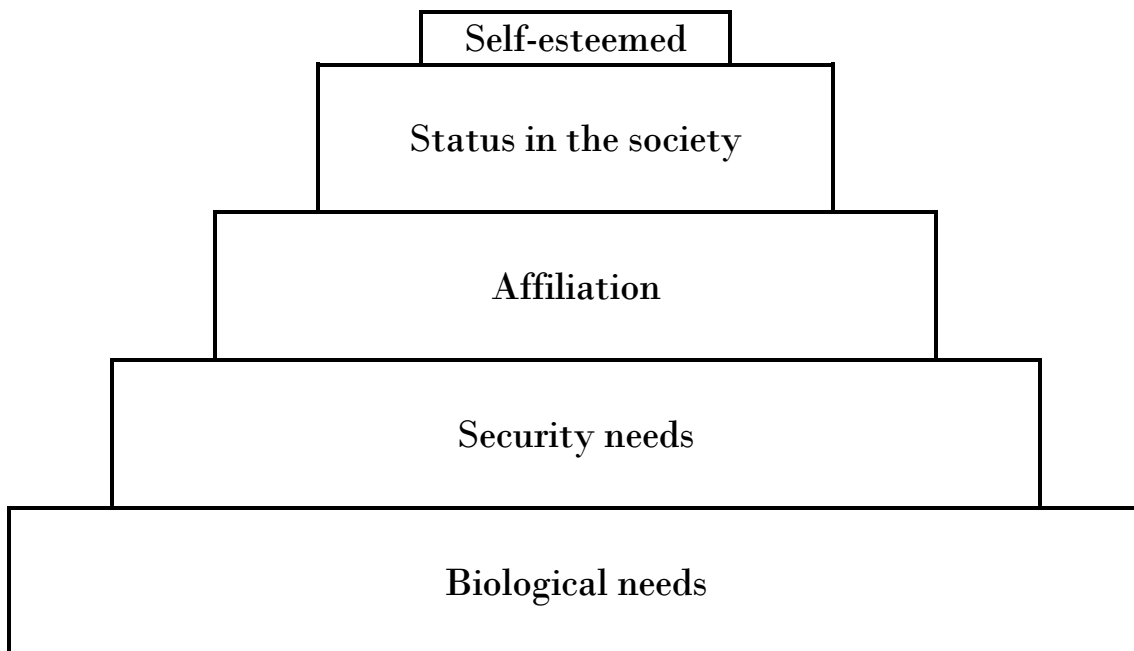
2. Reply at the questions:
   a) Is working, economic activity, an objective necessity?
   b) What kind of links can we establish between desires and interests? What is the case with desires and purposes?
   c) What will determine need's multiplication and diversity?

3. In which way laziness can be considered as a source for technological improvement?

1. The needs will be expressed in the wish of having:
   A) Objects

B) Services
C) Informations
D) social recognition
E) all of above
F) none of them