Always use 3 decimal places.

GROUP I

1. A given anti-poverty programme supports households according to their income. The distribution of benefits according to benefit level is shown in the following table:

Table: Distribution of benefits

Monthly benefit	% households
0 – 75	10
75 – 150	15
150 - 300	16
300 - 750	25
>750	34

Source: Department of Human Resources

(1,50 val) a) Depict graphically the simple and cumulative frequencies of this distribution.

(1,00 val) b) Compute the mean and median value of the distribution.

(1,00 val) c) Compute the standard deviation and the coefficient of variation of this distribution.

(0,50 val) d) Taking into account the measures computed, analyse and explain the behaviour of the distribution in term of symmetry.

(1,50 val) e) Assuming that the Programme sets benefits levels as a decreasing function of households income discuss, computing the Gini index, to what extent the programme is focused on lower income households.

(1,50 val) f) Consider that due to the need to consolidate public finances, the Government decides to eliminate the benefits to the households with income in the two highest classes of income. Compute the mean level of benefits in the new situation.

GROUP II

1. Consider the data on the level of expenditure of the programme mentioned in I.

Table: Level of expenditure in anti-poverty programme

Year	2007	2009	2011	2013
Expenditure (millions of euros)	47,4	50,5	53,2	54,2

Source: Management reports

(1,00 val) a) If you know that in 2010 the expenditure increased 2,4%, which was the rate of change of the expenditure in 2011?

(1,00 val) b) Which was the rate of change of the expenditure between 2007 and 2013 and which was the average annual rate of change of expenditure in the same period?

(1,25 val) c) The government set a goal of reduction of expenditure in this program from 2011 to 2014 of 4%. Which has to be the change of expenditure in 2014 in order to allow for that target to be achieved?

(1,25 val) d) Knowing that between 2005 and 2007 expenditure changed at an average rate of change 1.5 p.p. lower than that registered between 2007 and 2009, compute the level of expenditure in 2005.

GROUP III

1. Consider the following information on the evolution of social expenditure in one country

Table: Information on the evolution of sales

	2009	2010	2011	2012	2013
Social expenditure at 2009 prices (million euros)	120 000,0	118 800,0	119 631,6	121 426,1	122 640,3
Rate of change of social expenditure at current prices (%)	2,212	-0,307	0,901	2,007	2,313

Source: Department of social policy

(2,00 val) a) Compute for each year the 2009 fixed base index of prices of social expenditure and the chain index of prices of social expenditure.

(2,00 val) b) Compute the level of social expenditure in 2013 at current and at 2011 prices.

(1,50 val) c) If it is expected that prices of social expenditure increase 1,2% in 2014 and that the level of social expenditure at current prices in 2014 is going to be 125.000 million de euros, compute the real growth rate of social expenditure in 2014.

GROUP IV

1. Considering the data on income and level of benefits of the programme mentioned in group I it was decided to analyse the relationship between the two variables.

Table: Information on the level of income and benefits

Yearly income (€)	3600	7800	15000	2600	4300	3200	5500
Benefits (€)	680	55	20	900	490	790	70

Source: Company reports

(2,25 val) a) Compute the regression line that better represents the relationship between these two variables. Comment to what extent the relationship is strong.

(0,75 val) b) Discuss to what extent the goal of concentrating the benefits in lower income households is being accomplished.