



Always use 3 decimal places.

GROUP I

1. Assume that you are analysing the distribution of the investment intentions in a given industry in 2012 and you collected the information on investment intentions of the firms in that industry.

Table: Investment intentions

Investment class	% firms
0 €	46
From 0 to 100.000 €	26
From 100.000 to 500.000€	16
From 500.000 to 1.000.000 €	8
Over 1.000.000€	4

Source: Reports business association

- (1,00 val) a) Compute the average and median of the distribution.
- (1,00 val) b) Compute the standard deviation and the coefficient of variation of the distribution.
- (1,50 val) c) Present the histogram and the cumulative frequency line and analyse the symmetry of the distribution. Compare the results with those you can derive from the measures computed in a).
- (1,50 val) d) Compute and comment the value of Gini Index of this distribution.

2. Say, and justify, whether the following sentences are true or false:

- (1,00 val) **a)** "If one knows that in a given distribution all observations are undervalued by 5% then one can say that both the mean and the standard deviation that were computed are also undervalued by 5%".
- (1,00 val) **b)** "The austerity measures taken will decrease the disposable income of every citizen by 4%. So both the median income and the Gini Index of concentration will be both reduced by 4%".

GROUP II

1. Consider the following information about the production of a given company.

Table: Production information

	2007	2008	2011
Production (tones)	16.879	20.659	20.450

Source : Company reports

- (2,00 val) a) If in 2009 production decreased by 2,2%, compute the anual avergae growth rate and the growth rate between 2009 and 2011.
- (0,50 val) b) Compute the production growth rate in 2008.
- (1,00 val) c) If between 2000 and 2007 production has grown at the annual average growth rate of 2,35%, compute the value of production in 2000.
- (1,00 val) d) If between 2000 and 2004 production has grown 7,1%, which was the average annual growth rate between 2004 and 2007?

GROUP III

1. You know the following information about the sales value and prices of a given company:

Table: Sales information

Sales value	2005=2,63 M€	$r_{2006,2005}=3,5\%$	$\delta_{2007,2005}=7,4\%$	$\delta_{2008,2005}=8,5\%$	$i_{2009,2008}=97,1$	$i_{2010,2005}=112,3$
Prices		$r_{2006,2005}=2,3\%$	$\delta_{2007,2005}=5,1\%$	$\delta_{2008,2005}=8,3\%$	$i_{2009,2008}=99,3$	$i_{2010,2006}=108,4$

Source: Company reports

- (1,50 val) a) Compute the series of the 2008 fixed base price indices.
- (0,75 val) b) Compute, for each year, the value of sales at current prices.
- (1,50 val) c) Compute, for each year, the value of sales at 2008 fixed prices.
- (1,75 val) d) Compute the value of sales in 2006 at 2010 prices and the value of sales in 2010 at 2007 prices.

GROUP IV

1. The manager of the marketing unit of a given company is studying the relationship among the expenses in promotion and sales value. With the data form the last 10 years he estimated the following equation:

$$\text{Sales} = 70 + 1,2 * \text{Advertisement expenses.}$$

- (0,50 val) a) Analyse the results and say whether is rational to invest in promotion.
- (1,25 val) b) If in 2012 the marketing unit expands its budget by 10% which is the expected growth of sales?
- (1,25 val) c) Assuming that the average expenses in the last 10 years was 600 thousand euros, which was the average value of sales in that period?