

# NUMERICAL REASONING MCQ

for European institution competitions



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■ Part 5

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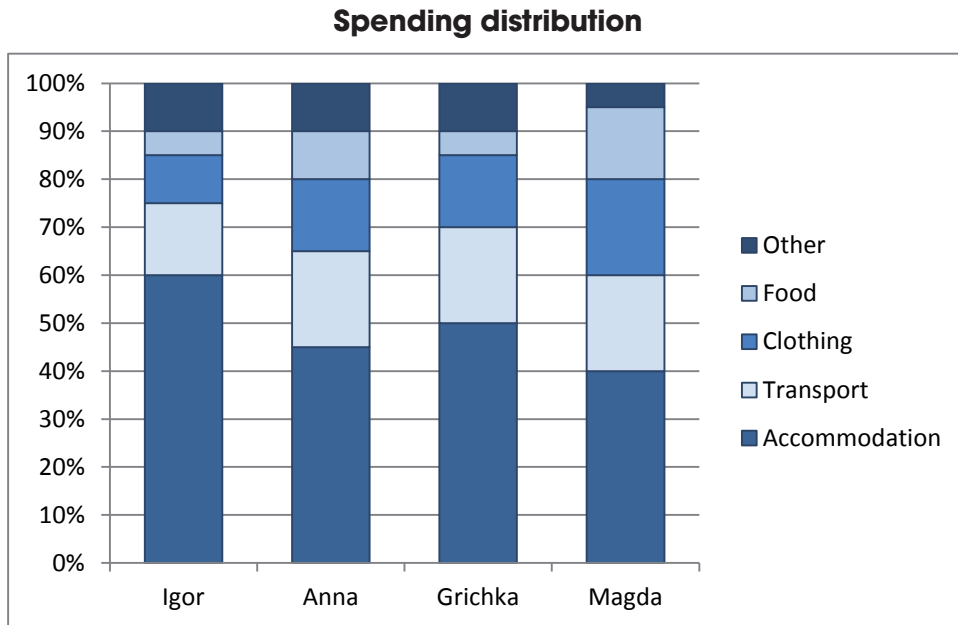
  

**Who are we?** ..... 231

## CHAPTER 6 - SOLVING DISTRIBUTION PROBLEMS

### 1. EXAMPLE QUESTION

Here is a first question involving a distribution problem. Take your time answering it. The answer appears on the following page.



- Q2.** Grichka spent 480 euros on clothing, ie 20% less than Anna. How much did Anna spend on accommodation?
- a) 1 152 euros
  - b) 1 440 euros
  - c) 1 728 euros
  - d) 1 800 euros
  - e) Impossible to tell

## 2. ANSWER

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The correct answer to question 2 is answer d).

## 3. METHOD

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You must proceed in two stages:

- firstly, use the information contained in the text to calculate Anna's spending on clothing;
- then, use the data in the graph to calculate Anna's spending on accommodation.

## 4. RESOLUTION

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### ► Resolution - stage 1

"Grichka spent 480 euros on clothing, ie 20% less than Anna." This means that if we deduct 20% from Anna's spending on clothing, we get Grichka's spending on clothing. So, the equation to solve is as follows:

$$\begin{aligned} \text{Anna's spending on clothing} - (20\% \times \text{Anna's spending on clothing}) \\ = \text{Grichka's spending on clothing} \end{aligned}$$

By simplifying this, we get:

$$0.8 \times \text{Anna's spending on clothing} = \text{Grichka's spending on clothing}$$

Therefore:

$$\begin{aligned} \text{Anna's spending on clothing} &= \text{Grichka's spending on clothing} / 0.8 \\ &= 480 / 0.8 = 600 \end{aligned}$$

### ► Resolution - stage 2

The graph gives the distribution of Anna's spending under 5 headings (the total of each column = 100%). We see that:

- clothing accounts for 15% of her spending;
- accommodation accounts for 45% of her spending.

Anna's spending on accommodation is therefore three times greater than her spending on clothing. Therefore the equation to be solved is:

$$\text{Anna's spending on accommodation} = 3 \times \text{Anna's spending on clothing}$$

Therefore:

$$\text{Anna's spending on accommodation} = 3 \times 600 = \mathbf{1\ 800\ euros}$$

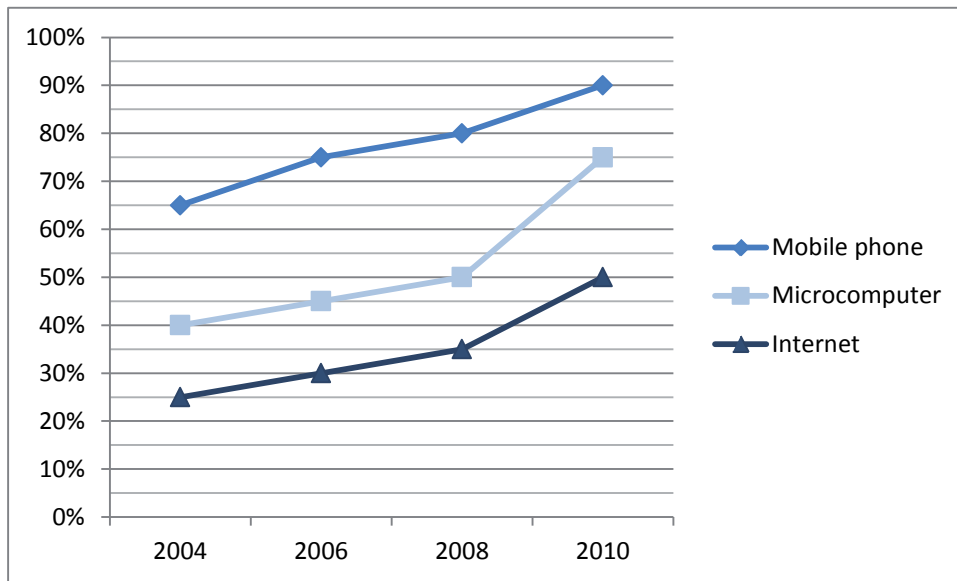
**Cereal production in Poldavia  
(in thousands of tonnes)**

	2006	2007	2008	2009
<b>Wheat</b>	5 809	4 982	5 737	5 333
<b>Barley</b>	1 089	987	1 234	910
<b>Oats</b>	428	391	508	472
<b>Maize</b>	6 109	7 367	6 491	7 990

83. In 2010, Poldavia exported 4 981 500 tonnes of wheat, ie 2.5% more than in 2008. In 2008, what percentage of Poldavia's wheat production was sold on its internal market?

- a) 10%
- b) 15%
- c) 75%
- d) 85%
- e) 90%

**Household equipment rates for mobile phones, microcomputers and internet**



84. In 2008, there were 2 480 600 households. What was the minimum number of households that had both a mobile phone and a microcomputer in 2008?

- a) None
- b) 496 120
- c) 744 180
- d) 1 118 520
- e) 1 860 450

## 5 ▶ C

### Understanding the question and method

We need to proceed in three stages:

- first, we calculate the catches of tuna and cod in 2005;
- next, we calculate the catches of tuna and cod in 2010 using the data in the graph;
- then, we calculate the relative variation between these two years.

### Solution

#### Stage 1:

Cod catch in 2005:  $1\,400 - 600 = 800$

Tuna catch in 2005:  $1\,400 + 200 = 1\,600$

Cod and tuna catches in 2005:  $800 + 1\,600 = 2\,400$

#### Stage 2:

Cod and tuna catches in 2010:  $1\,000 + 2\,000 = 3\,000$

#### Stage 3:

Relative variation:  $(3\,000 - 2\,400) / 2\,400 = 0.25 = + \mathbf{25\%}$

## 6 ▶ B

### Understanding the question and method

The aim is to find the average annual fruit production for the period 2009-2010. This is a simple average: we divide the total production by the number of years, ie by 2.

Fruit production in 2009 and in 2010 is calculated in the same way. For example:

Pear production in 2009 =  $16\% \times$  fruit production

Therefore:

Fruit production in 2009 = pear production / 0.16

### Solution

Fruit production in 2009 =  $216 / 0.16 = 1\,350$

Fruit production in 2010 =  $312 / 0.12 = 2\,600$

Annual average =  $(1\,350 + 2\,600) / 2 = \mathbf{1\,975\ tonnes}$

## 7 ▶ B

### Understanding the question

In the category "part-time / aged under 50", we have to find the percentage who work fewer than 15 hours per week.