

CHIEF EXAMINER'S REPORT MARCH 2004

APPLICATION OF NUMBER LEVEL 3

General Comments

This paper was slightly less demanding than some recent ones. Overall there was good coverage of the skills in part A of the specifications and a reasonable balance of skills across the paper. Questions were set in realistic contexts and at an appropriate level. Both the pass mark and the percentage of candidates passing this paper were similar to those in previous series.

Although clearly expressed, some questions were quite wordy, with some long sentences containing a mixture of text and numerical information. In overall length, this paper was less demanding than some others, although there were candidates who failed to complete the final extended answer question, where some marks may have been more easily obtainable than on earlier questions.

The questions answered most successfully involved scaling quantities, estimating a ratio, proportional increase and calculating the size of an angle in a right-angled triangle. Other areas where many candidates gained marks were using and rearranging a formula, using a pie chart, and multi-stage calculations of transport costs.

The graph question was not done well by many candidates. The mean of grouped data was not calculated as accurately as in previous series. The question that was handled least successfully required a multi-stage calculation involving the volume of cylinders and converting between units.

Inappropriate rounding was once again a common cause of error. Some candidates rounded figures obtained part way through a multi-stage calculation, leading to error in the final result. Others failed to round their final answer to a suitable degree of accuracy, or truncated their final answer instead of rounding it.

Comments on Particular Aspects of the Question Paper

The paper opened with a quite straightforward question about TV production costs and most candidates scored at least some marks on it. A common error was an incorrect choice of method to find a percentage – some candidates inverted the calculation. When required to find an approximate ratio in its simplest form, some failed to round the values before simplifying, while others lost marks by writing the ratio in the wrong order.

A question about the heights of boys required reading values from a complex graph and was done accurately by a fair proportion of candidates. A comparison of the information in the graph and data in a table was less well done. When some mention of the average or mean height was required, some candidates gave answers that were too general; others compared the minimum or maximum heights instead of using the range.

A further question concerned calculation of the reading age of texts. On the whole, candidates used the formula given to produce accurate answers, but the main problems arose when calculating the mean from grouped data. Incorrect midpoints were commonly seen and a fair proportion of candidates showed no understanding of the correct method for dealing with grouped data.

A calculation of the number of stairs in a staircase was a difficult one and few candidates obtained the correct answer. However, a sizeable proportion was able to gain marks by working out the length of the staircase. The angle of elevation of the staircase was often accurately calculated, although some candidates made an incorrect choice of trigonometrical formula at this point, while others chose a lengthy two-stage method involving the hypotenuse.

In the graph question, marks were commonly lost through failure to include a title and appropriate axis labels or failure to use a suitable linear scale. Candidates also lost marks on plotting, either through inaccurate rounding of the data provided or as a consequence of poor choice of scales. Most candidates provided a reasonable interpretation of the graph, but fewer were successful in reading a value from their graph through incorrect reading of their scale.

A question about the UK consumption of bananas was generally well done, although a proportion of candidates misread the first part and gave the number of bananas eaten per week instead of per year. The compounded percentage was well handled by many candidates.

The extended answer question opened with a multi-stage calculation involving the volume of a cylinder. Few candidates gained full marks on this question; a fair proportion reached the first stage successfully by calculating the volume, although some used the diameter of the cylinder instead of the radius, while others showed no knowledge of the correct formula. The most common problem arose from the fact that the dimensions of the cylinder were given in millimetres and the solution required the volume in litres. The calculations of the earnings of a worker and proportional production costs posed fewer problems. The calculation of transport costs discriminated well between candidates who were able to use algebra or trial and improvement and those who did not use a suitable method.

Recommendations to Centres

Centres must ensure that candidates:

- apply their numerical skills to problems set in context
- read each question carefully to extract all the relevant details and after finishing a question, check to see they have answered it fully
- avoid premature rounding in multi-stage calculations
- choose appropriate levels of accuracy and be guided by the data provided
- practise handling grouped data
- convert between different units accurately when required, particularly when dealing with area and volume
- solve problems involving construction and solution of simple equations
- follow the conventions used for graphical presentations, in particular titles and appropriate scales