

Chief Examiner's Report

June 2007 Series

Application of Number Level 3

General Comments

The paper was well balanced and of a comparable standard to those used in previous series, and was similarly lengthy and demanding in terms of the amount and complexity of information presented. Many candidates did not attempt all the questions. The opening question was demanding, and may have led to a less than encouraging start to the paper. It was clear that many candidates were selective in the questions they attempted and the order in which they did them, and some found it advantageous to begin with the final, extended answer question.

As in recent previous series, candidates were allowed 15 minutes for reading time. Centres are recommended to advise candidates on ways of using this time to best effect, to identify key information, select methods and make rough notes.

The pass mark on this paper was similar to previous series and the proportion of candidates obtaining a pass mark was also similar to previous series. There was appreciable variation in the performance of candidates in different centres. Whereas some made a reasonable attempt at questions, others showed little evidence of preparation for the types of question that are commonly seen at this level. Errors were seen in identifying and using the information given, and in the choice and application of methods. Incorrect decisions on rounding were a common reason for incorrect answers; candidates lost marks by rounding or truncating part way through a calculation, writing down and using rounded results of stages of their method, rather than holding results on their calculator.

The questions answered most successfully were those involving using a formula, calculations using proportion, and compounded percentages. Questions on finding the mean from a grouped frequency table, area and volume and right-angled triangles were often handled well by stronger candidates, but others showed weaknesses in these areas. The weakest responses were seen on questions involving converting units, scaling dimensions and algebra.

Comments on Particular Aspects of the Question Paper

The paper opened with a question on UK spending on clothing. Relatively few candidates were able to calculate a straightforward percentage increase, with many instances of incorrect method seen. The compounded percentage question was identified by many but lengthy and error-prone methods were often used. Many candidates calculated the correct value in response to a ratio question, but some lost a mark through omission of the units in their answer. A part question involving use of fractions presented complex information, and was not generally well answered.

A question about the outer perimeter of a running track was rarely answered correctly. Many candidates failed to take account of the curved sections of the track and found the perimeter of a rectangle, and others used the formula for the area of a circle instead of the circumference. A part question asking for an approximate fraction was also poorly handled. Suitable calculations were often seen to find the values required, but many candidates did not approximate the values or give their answers as a fraction in the form $\frac{a}{b}$. The algebra questions were omitted or abandoned incomplete by many candidates.

Few correct answers were seen to a question about the cost of electricity. Some candidates used an incorrect value for the number of days in a year; others omitted to convert pence to pounds. A question about overall UK electricity consumption on lighting was handled better, but some candidates had difficulties interpreting the large numbers given, for example, 1.2×10^6 was read as 12 000 000.

Most candidates gained marks on a question about wheat production, involving calculations of proportion. The formula for the capacity of a grain silo was often used correctly, although some candidates used the value for the diameter instead of the radius. Some candidates interpreted the expression $2h_1 + h_2$ as $2(h_1 + h_2)$ and a few found $(\pi r)^2$ instead of πr^2 . A number of candidates lost a mark by omitting to state whether the silo was big enough to store the amount of wheat found earlier in the question. The trigonometry questions were handled well by stronger candidates. A common problem was in finding the dimensions and many candidates had difficulty in adding 250 millimetres to 15.9 metres. Candidates should note that where they are asked to check using an alternative method, a reverse calculation is not sufficient. They should use Pythagoras' theorem to check a result obtained by trigonometry or vice versa.

A question involving use of dimensions taken from a scale diagram was poorly answered overall. Many candidates failed to use the scale correctly, many finding the area of the diagram, then applying the scale factor, rather than scaling the dimensions. Another common weakness was in converting between millimetres and metres. Some correct results were seen to a question using a relatively straightforward formula, but some candidates ignored the brackets. Few were successful in reading a value from a complex table.

The extended answer question was about the amount of time spent watching television. Many candidates gained some marks by drawing a cumulative frequency graph, but few completely correct graphs were seen. Common errors included omission of a title or of axis labels with correct units. Many candidates omitted to use continuous linear scales or drew scales which did not accommodate all the values. The height of plots was generally correct, although some candidates plotted on the midpoint of the class instead of the upper class boundary. Candidates generally showed awareness of the correct method of using a cumulative frequency curve to estimate the median and the interquartile range. Many made valid comparisons of the medians for two years, but few were able to interpret the interquartile range successfully. Stronger candidates found the correct mean from a grouped frequency table, but incorrect methods were often seen.

Recommendations to Centres

Centres must ensure that candidates:

- use the reading time to best effect, to identify key data and plan their approach to solving the problems, making rough notes if necessary
- practise using very large and very small numbers
- solve problems involving construction and solution of simple equations
- solve problems involving scale diagrams, area and volume and conversion between different units of measurement
- avoid premature rounding in multi-stage calculations
- check to see they have answered each question fully after finishing it
- follow the conventions used for graphical presentations, in particular titles, appropriate labelling and units, and use suitable linear scales where necessary.

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