

Application of Number Level 3 November 2007

General Comments

The paper was quite long and contained a good deal of material for candidates to read in order to access the questions, but it was similar in standard to papers used in previous series. Many candidates made some attempt at all the questions, and it is clear that they selected the order in which to attempt the paper, some candidates finding it beneficial to do the Extended Answer question first. The paper was well structured, and the opening questions were accessible, giving candidates an encouraging start to the paper. The questions were based on scenarios which would have been familiar to candidates, and questions gave overall balanced coverage of the skills described in Part A of the Application of Number standards.

The pass mark on this paper was slightly higher than in previous series and the proportion of candidates obtaining a pass mark was noticeably higher than previously. Candidates in some centres showed clear evidence of preparation for the types of question that are commonly seen at this level. In other centres, errors in identifying and using the information given, and in the choice and application of methods, indicated that candidates were not confident enough in their skills to be ready for the test.

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

Comments on Particular Aspects of the Question Paper

The first question dealt with queries answered by an Internet search engine, and most candidates gained some marks on it. A surprising proportion of candidates failed to use a correct method to find a relatively straightforward percentage increase. Many candidates successfully identified the compounded percentage question and gave a correct answer, although some failed to gain maximum marks by giving the number of years it would take for the number of queries to exceed a given value rather than the year in which the value would be exceeded.

A question about a circular water feature was generally well answered. Most candidates were able to substitute correct values into a formula to find the volume of concrete needed for a plinth, and many tackled the scaled dimensions question well, showing correct working and giving a decision based on it.

A question about travel offers was less confidently approached. Few candidates gave an acceptable answer to question which asked for a simple fraction. Some gave their answer as a percentage rather than a fraction, others failed to do any approximation, and some did not simplify their fraction. Many correct answers were seen to a question comparing two travel deals which required handling complex information. Questions involving simultaneous equations were well handled by stronger candidates, but many incorrect attempts at writing and using simple equations were seen. There was an added complication in the data for this question compared to similar ones on other papers, but candidates who failed to take this into account were

compensated if they used their own equations correctly.

A question about the volume of water in a swimming pool was correctly answered by a good proportion of candidates. Common errors mainly involved choice of method to find the volume of a triangular prism. A question on the distance between the shallow end of the pool and a marker showing the depth of water was rarely answered correctly, with many candidates unable to identify a correct method using trigonometry or similar triangles. Correct answers were frequently seen for a question about the numbers of bathers in the pool involving calculations of proportion. Some candidates did not gain all the marks available here because of incorrect rounding, whilst others failed to find the correct area of the pool. For a problem about water flow through a pump involving conversion from litres to gallons, correct methods were selected but some candidates failed to round answers as required.

A subsequent question involved games downloads on mobile phones. One part required candidates to interpret two pie charts on the shares of revenue from downloads in different world regions. Many valid comments were seen, but some answers omitted the required numerical comparisons, while others showed confusion between the actual revenue and revenue share. Calculations of the predicted increase in revenue share, and use of a formula to predict total world revenue, were generally well tackled. A question involving an approximate ratio was not often answered correctly. Some approximation was seen, but many answers were not simplified, and, in a few cases, the ratio was reversed.

The extended answer question was about the growth heights of different varieties of sunflower. Many candidates gained some marks by drawing a cumulative frequency graph, but not many completely correct graphs were seen. Common errors included omission of a title or of axis labels with correct units. Many candidates did not 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, although some answers assumed a data set of 100 instead of the actual 89. Stronger candidates found the correct mean from a grouped frequency table, but incorrect methods were often seen. Many candidates made valid comparisons of the average heights of the two varieties, but few were able to interpret the interquartile range successfully.

Recommendations to Centres

Centres must ensure that candidates:

- practise solving problems involving construction and solution of simple equations
- solve problems involving area and volume
- round answers to a suitable level of accuracy, following guidance in the question or from the data given
- practise interpreting results of 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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