

## **Application of Number Level 3 June 2008**

### **General Comments**

The paper was slightly more complex than those used in previous series, in terms of its overall length and the information presented. Many candidates did not attempt all the questions and it was clear that they were selective in the questions they attempted and the order in which they did them. As in previous recent series, a number of candidates opted to begin with the final, extended answer question. Some found this advantageous, but in this paper the extended question was longer and more demanding than previously, and, while answering this question well, some appeared to spend too long on it, and did not perform so well on the remaining parts of the paper.

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 June 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, and on a number of scripts there was high omission rate, and evidence of misunderstanding of basic concepts. 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 loss of marks; candidates rounded or truncated part way through a calculation, and used 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 trigonometry 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 about a sponsored swim which needed some care to answer correctly. The first part, about the speed of a swimmer, required the time in hours and minutes to be converted to a decimal, which many candidates omitted to do. In the second part, the number of complete lengths was required, but unrounded answers were often seen. A comparison of the amounts raised by a swimmer and a group of walkers was generally well answered, although some candidates compared the amount raised by one swimmer with that of the whole group of runners rather than the average per runner.

In a question about bird populations, most candidates gained some marks, but some parts were more successfully completed than others. Many correct answers were seen to the first part, a comparison of frequency of birds per square kilometre, but relatively few candidates identified the reverse percentage question in part b, and almost all of these gave an incorrectly rounded answer – the information given in the question was to three significant figures, and a similarly rounded answer was expected. Part c required a complex multi-stage calculation using information given in text and a table, but was correctly answered by stronger candidates. Others omitted to include the average length of visit or did calculations using the wrong figures, and attempts to calculate 3.975% by dividing by 3.975 were seen.

A question involving use of dimensions taken from a scale diagram was poorly answered overall. Many candidates failed to use the scale correctly, and found the area of the diagram, and then applied the scale factor, rather than scaling up to find the actual dimensions first. Other common weaknesses were in converting between millimetres and metres, and in using the diameter instead of the radius to find the area of a circle. The trigonometry question was a complex one, involving additional steps to find the dimensions needed for the calculation. Few completely correct answers were seen, but there was evidence of misunderstanding of basic concepts in the choice of formula and in rearranging formulae to find the unknown value.

A question about sales at a garden centre was reasonably well answered in parts. Some correct estimated fractions were seen for part a, although many candidates gave answers which were either not approximations or not given in a simple form. In questions of this type, answers are expected in the form  $\frac{a}{b}$ , where a and b are integers; percentages are not acceptable. Parts b and c were generally well answered, as was the formula question in part d. The algebra questions were omitted or abandoned incomplete by many candidates.

A question about a lido required complex multi-stage calculations, involving conversions between different units and calculation of area and volume. Some correct answers were seen from candidates who broke down the problem into a series of stages and set out their working clearly, sometimes with sketch diagrams. Some promising attempts were seen, but with one step missing, for example finding the area of only one side of the pool instead of both sides. In other instances, candidates made the conversion from square feet to square metres for the area of each side of the pool instead of once for the total area of all the sides, which complicated the calculation and led to errors. A more basic error, frequently seen, concerned conversions. Some candidates tried to use the conversion rate between square metres and square feet to convert the dimensions of the lido from feet to metres. On part c, the feet to metres conversion rate given in the question was used incorrectly, in an attempt to convert cubic feet to cubic metres.

The extended answer question was about public libraries. Most candidates gained some marks by drawing a line graph, but relatively few completely correct graphs were seen. Common errors included omission of a title or of axis labels with correct units. Correct linear scales were often drawn, although some candidates made

plotting more difficult by choosing unusual scales. When using their graph to estimate when loans of one type of book overtook another, some candidates failed to appreciate the significance of the phrase 'two consecutive years'. Part g asked for a mean from a grouped frequency table, and correct methods were seen as often as incorrect ones. Common errors included finding the sum of the midpoints, or dividing by the number of intervals. The compounded percentage question was identified and generally well answered.

### **Recommendations to Centres**

Centres must ensure that candidates:

- practise breaking down complex problems into stages, setting out working clearly and using sketch diagrams where this is helpful
- 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.

Chief Examiner  
July 2008