

KEY SKILLS APPLICATION OF NUMBER (MAY SERIES) 2004

Chief Examiner's Report

Level 1

This paper was of a typical standard in comparison to recent papers and only a small number of questions caused a major problem for candidates.

Areas of strength include:

- Interpreting information from simple tables and charts. They need to understand reference to 'vertical' or 'horizontal' axes. Most charts do not require a key/legend.
- Questions changing from numbers to words and vice versa.
- Candidates are able to round numbers as suggested by the specifications.
- Reading simple scales/dials/clocks.
- A number of questions using simple arithmetic of decimals and integers were well done; candidates are generally quite happy with questions involving money!
- Choice of suitable units eg for the 'weight' of a box.
- While the majority was able to do the questions involving the use of simple scales, this remains a topic which would benefit from further attention.

Problems were evident as below:

- A substantial number of candidates show evidence of problems with vocabulary like 'mean' and 'range'. Range questions are particularly badly attempted; candidates often find the mode when asked to calculate the mean.
- Many candidates could calculate 10% of a number like 700 (i.e. ending in 0), but fewer could later calculate 10% of a number like 3795.
- Only a minority could write $\frac{3}{5}$ as a percentage or calculate $\frac{2}{5}$ of a quantity.
- There are weaknesses in problems using given ratios.
- Ways of checking calculations.
- Area of a rectangle and volume of a cuboid (including simple decimal numbers). Too many candidates are adding measurements.

Level 2

This paper was felt to give a good variety of content and level of difficulty. In many of the questions the numbers were relatively 'user-friendly' and this seems to be reflected in the scores in some topics where the percentage correct is usually lower.

We would remind you that Level 2 will include a majority of questions where the candidate must choose the calculations and their order (ie more than one step). The relevant information may be presented in a written or tabular or diagrammatic format (or a combination).

There were good responses to some questions involving:

- interpretation of a timetable;
- conversion from inches to centimetres;
- interpreting a pie chart and line graph;
- reading tables and scales/dials.

Questions that posed problems for a majority of students included:

- A bank balance calculation including a negative balance.
- Various calculations about percentage - including a simple percentage reduction in a price and finding a cost including V.A.T.
- Statistical vocabulary i.e. mean, median, mode and range: there is really no valid excuse for the poor performance on questions (both at level 1 and level 2) about range, where the arithmetic required to obtain the answer is straightforward.
- A question with a graph scaled in millions caused many difficulty, as the interpretation of the data required an answer less than one million to be written in full.
- Ways of checking calculations. Candidates find these questions particularly difficult when the checking method involves some form of reverse calculations.
- Substitution into formulae.
- Sharing in a given ratio.
- Area and Volume; it is disturbing to find that large numbers of candidates still ADD the dimensions. Many candidates are unable to find the area of an L shape.
- Change of units both within measurement systems (eg cm^3 to litres) and between systems (eg gallons to litres) - which may require approximation of the answer.
- Interpreting and using scales and scale drawings.
- Writing one number as a fraction or percentage of another.

Candidates need to be aware that terms like ‘above’ and ‘below’ are **not** inclusive.

Level 3

It is pleasing to report that there was an increased number of candidates who were well prepared for this test. The performance varied with centre, but some centres have clearly heeded the advice given at training days and in Examiner’s comments, in preparing candidates for the requirements of the specifications. Several candidates scored over 90% of the maximum marks. However examiners still report a substantial minority of students who are unable to perform adequately in the test at Level 3. These exhibited many weaknesses in their knowledge and use of Number skills.

This paper was felt to be a fair test of the specifications and allowed access to most questions for all candidates. The data was probably slightly less complex than in, for example, the March test. The questions gave candidates good opportunities to pick up marks.

Candidates should be reminded that part marks and ‘follow through’ marks can only be awarded when steps are shown.

Some issues specific to this paper:

Q.1 Generally well answered – some did not pick up the concept of producing a simple fraction to make the comparison.

Q.2 (a) Again, the idea of producing a simple comparison – this time as a ratio.

(b) Many candidates did relevant divisions but totally misinterpreted the answers! The most consistent correct interpretations came from candidates who worked out the percentage of bags each airline lost. Other methods were acceptable.

Some centres’ candidates formed and solved simultaneous equations with confidence. The mark for (e) cannot be given unless substitution is seen in (d).

Q.3 (a) Most candidates correctly stated the modal class and class containing the median.

(b) This was another area where there was a marked difference between centres. Some centres had candidates who were prepared for this routine calculation; other centres’ candidates were largely unsuccessful.

(c) It is not sufficient to merely restate the definition of the average to justify a choice – there needs to be a reference to the data or context.

(d) Surprisingly poorly done: some candidates seem to have misunderstood the ‘predict’.

Q.4 (a) The combination of scaling and area (or volume) has caused problems before. The scaling should precede the area. Candidates need to know what units are in use at all stages of a calculation.

(b) Volume of a cylinder: formula not known, carelessness with units, inability to share in the ratio meant that full marks were seldom awarded.

(c) It was pleasing to see many correct uses of trigonometry and Pythagoras.

Q.5 In this question the quantity and complexity of information caught out many candidates.

(a) The distance travelled for the 4 weeks was often incorrect. The answer is not obtained by averaging the costs per mile for the 4 weeks.

(b) There are 52 weeks in a year! 'Estimate' here refers to the limit in accuracy in predicting the future – it does not imply approximation.

(c) In (c) 'estimate' refers to the context of being limited by the accuracy of the available data. However the candidate should work with the data as accurately as possible until using the answer in a sensible way in interpretation.

(d) Once again, the issue of becoming lost in using Simple Proportion was evident. Candidates need to think through the steps and record units to 'control' the information as it is processed.

Q.6 (a) Many incomplete responses.

(b) In both parts, the most successful candidates used a **factor** for percentage change ie in (a) dividing by 0.93; in (b) multiplying by 0.955

Q.7 (a) A disappointing response to a simple substitution question.

(b) In (b) more candidates showed an understanding of what was required.

The graph requires a title and scales labelled with units. The question made it clear that the graph needed to extend to 100 days to allow a prediction. Day is the independent variable. Failure in these lost marks.

(f) Many correct responses (often on follow-through).

(g) Many correct H values, but few candidates retained sufficient accuracy to obtain full marks by finding the percentage change.

(h) Not surprisingly, few used an equation, which was the simplest route to a solution. Others used 'make a few guesses and get lost' rather than 'trial and **improvement!**'

I would again encourage the use of the wide range of question papers and mark schemes available at Level 3. While there may be some minor errors in a few circulated mark schemes, these papers should provide candidates and their teachers with a clear idea of the standard required at this level. Some centres appear to have made good use of these to prepare for the type of problem set at Level 3.