GCSE

Mathematics

8300/1F Paper 1 Foundation

Report on the Examination

Specification 8300

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General
The assessment provided students of all abilities the opportunity to demonstrate their knowledge including a variety of elements of the new AO2 in mathematical communication. Several of these questions were well answered. There was little evidence of students lacking the knowledge to attempt the questions and no evidence that any students were short of time.

Topics that were answered well included:

- long multiplication
- working with money
- solving simple equations
- identifying and explaining an unusual data value
- working out a problem in a dice context

Topics which students found difficult included:

- finding a fraction half way between two other fractions
- working with ratio
- properties of shapes shown in a Venn diagram
- using a quadratic graph
- division of mixed fractions
- solving a quadratic equation

Question 1
This question was not particularly well answered with the wrong answers all appearing regularly.

Question 2
This question was quite well answered.

Question 3
This question was quite well answered.

Question 4
This question was very well answered.

Question 5
This question was well answered. Students used either the traditional method or the grid method, on the whole, with the latter being a slightly better source of marks. As is often the case, the lack of the placeholder zero was a problem in the traditional method and the loss of important zeros was a problem in the grid method. Sometimes the only error seen was with the 3×6.

Question 6
This was well answered, with most dividing by 3 and then multiplying by 5. Those who first tried to divide 5 by 3 were less successful.

Question 7
This was quite well answered but plenty of arithmetic errors were evident in solutions. Students who tried to build up in 7s to 3206 rarely achieved this accurately.

Question 8
This was fairly well answered and proved to be an excellent discriminator with the values obtained allowed to be carried through into later calculations for full credit where appropriate. This was a

new topic for this specification but was clearly understood by students with any mark loss tending to be entirely down to arithmetical errors, especially in carrying out the calculation 87 × 3.

Question 9
This question was not very well answered. Marks were often scored on alternative method 5 with the correct marking of ½ and 1¼ on the line, but often stopped there as conversion into eighths proved a step too far. Those who went down the decimal route found 0.75 but struggled to get to 0.875; and of those who got this value, many did not then convert back to the required fraction.

Question 10
Most achieved at least two of the possible values but few found all four. There were a number of students who were showing the factor pairs in a division or multiplication but did not realise that they were actually achieving the required values and so different values often appeared as the answer.

Question 11
Part (a) was poorly done, with very few achieving the correct answer. However, part (b) was much better answered with nearly all identifying the correct values of 2, 3, 4, 5 and 6, but with some confusion as to the meaning of the word 'sum'.

Question 12

This question was not that well answered with $\frac{8}{14}$ a very common wrong answer.

Question 13
This question was quite well answered with order of operations well known.

Question 14
This question was well answered.

Question 15
This was quite well answered with a good number of students recognising properties of the shapes and identifying that opposite angles within a parallelogram are equal. The understanding of base angles within the isosceles triangle was also good, especially considering the rotation of the triangle itself. Many marks were achieved on the diagram itself but full marks were only possible with the correct answer in the written response or the answer space. There was a lack of knowledge of correct angle notation.

Question 16
This question was poorly answered. The most successful approach was to scale the ratio 1 : 6 up to 3 : 18 but even then many students failed to give the answer '18' after this.

Question 17
In part (a), the most common error was to explain a different method to calculate the answer to the one that Laura used. For example, rather than showing why her method was incorrect, students stated that to find 3% of 1700 the 1700 should be divided by a 100 and the result multiplied by 3. Some stated $1700 \times \frac{3}{100}$ was needed. These were correct methods to find 3%, but neither answered the question. Some thought that Laura's method was correct stating that 3% = 0.3.

Although part (b) was more successful than part (a), many could not explain their reasoning in a convincing way with vague references to the fraction being top heavy or improper.

Question 18
Many students achieved some credit in this question, but there were very few fully correct answers. This seemed to be more down to students not understanding the properties of the given shapes as opposed the workings of a Venn diagram. However, a few students did put the letters of the shapes in more than one section.

Question 19
Overall the performance on this question was not that good even though the ability to substitute into an algebraic expression was. The struggle was with the order of subtraction with very few realising that they could complete the subtraction the other way around and then make the answer negative. Too many students completed the final subtraction mentally and gave an incorrect answer of -46.5. Many more students would have gained full marks had they attempted some form of column subtraction.

Question 20
This question was very well answered.

Question 21
This question was a very good discriminator with a good spread of marks across students of different abilities. Students had a good understanding for listing outcomes with a majority doing this systematically and with much success. Very few adopted an approach using a two-way table to ensure they captured all the outcomes. Many marks were lost due to poor addition skills.

Question 22
Part (a) was not particularly well answered with errors in both squaring negatives and squaring 1, or both, very common.

In part (b) some credit was available for plotting their coordinates but the skill of drawing a smooth quadratic curve was needed to achieve both marks. Some joined their quadratic points using straight or multiple lines which is not acceptable.

In part (c), very few knew how to use their curve to estimate the given value.

Question 23
Part (a) was poorly done with few dealing successfully with the negative outside the bracket. The multiplying out in part (b) was done better although fully correct answers were rare.

In part (c) few achieved a convincing explanation of why the answer must be odd.

Question 24
There was some evidence that students had learned this value with about half getting this correct.

Question 25
This was not well answered although many managed to convert one or more of the numbers to improper form. Understanding the method of turning a division into a multiplication was quite well known but was also commonly confused with methods for other types of calculation, such as finding a common denominator. Even though there is an acceptable method using common denominators it did not seem as though many were genuinely carrying this out.

Question 26
This question was not at all well answered. Few seemed to be trying to calculate a distance divided by a time from the graph and those who did rarely chose the easiest values to work with,

just usually picking up one mark for reading off correctly. Many students were confused by the given scale.

Question 27
Part (a) was very well answered with the low data value for Day 8 identified and explained.

In part (b) many made a start with the number of planes per day but then either did not know the number of days per year or could not handle the scaling up calculation.

Part (c) was not well answered. Some students did indicate that the estimate could be too high or too low but very few could offer a relevant explanation of why.

Question 28
Student understanding of interior and exterior angles continues to be limited. Many incorrectly believed '360 ÷ number of sides' represents the interior angle and failed to subtract the result from 180. Very few students tried to use the sum of the interior angles by splitting the shape into triangles or using an appropriate formula.

Question 29
This question was rarely fully correct but many scored part marks. The left-hand side of the equation was usually either correctly evaluated or partly evaluated. Just seeing the value of $6^2 = 36$ or $8^2 = 64$ was enough to score and many made this correct start, although some thought that 6^2 was 12 and 8^2 was 16.

The right-hand side of the equation proved to be more challenging with very few students getting an answer of $5 \times a$ or $5a$.

Usually the sides of the equation were calculated separately. Very few were able bring their answers together to form a new equation with the answers obtained.

Question 30
This question was not well answered, possibly with confusion from the second value being more than double the first with many only finding the difference between the two values.

Question 31
Pupils often used trial and improvement and did find the answer of 4; but failed to recognise that a quadratic should have two solutions. Those that attempted to factorise often made errors but many did know to equate the brackets to zero.

Use of statistics

Statistics used in this report may be taken from incomplete processing data. However, this data still gives a true account on how students have performed for each question.

Mark Ranges and Award of Grades

Grade boundaries and cumulative percentage grades are available on the Results Statistics page of the AQA Website.