Questions matter

GCSE

Mathematics

8300/1F Paper 1 (non-calculator) Foundation

Report on the Examination

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Summary

Overall performance compared to last year

Most students were able to access the majority of the low and low-medium demand questions and were rewarded for good use of mathematics demonstrated at different levels of ability. There was still a good level of engagement at the top end of the paper.

Students should continue to be encouraged to show their working. Presentation and setting out of working were sometimes poor and for some students their digits 4 and 9 or 1 and 7 were indistinguishable. When plotting points, students should be encouraged to use a cross instead of a dot.

Topics where students excelled

- Basic arithmetic
- Converting from metres to centimetres
- Using the given conversion to go from kilometres to miles
- Finding the shaded section as a percentage of the whole grid
- Working with a fraction of a shape
- Rounding
- Parallel lines
- Working with squares, roots and index numbers
- Creating a systematic list for combinations
- Using multiples of two numbers to make the required number
- Congruent triangles
- Time-series graph

Topics where students struggled

- Understanding the connection between range and consistency
- Showing why a number cannot be created from a given formula
- Area of a triangle
- Vectors
- Upper and lower bounds
- Area of a circle when shown as the base of a cone
- Improper fractions
- Number line
- Solving inequalities
- Describing an enlargement

Individual questions

Question 1

This question was well answered in both parts. In part b, formal subtraction methods were more successful than 'building down' to the other number. The common mistakes were subtracting smallest digit from largest digit each time and getting an answer of 636 or rounding 438 to 440 and getting $1062 - 440 = 622$

Question 2

The conversion from metres to centimetres was more successful than the conversion between kilograms and grams. Using the given conversion between kilometres and miles was answered very well. The common wrong answer in part c came from $24 \div 8 = 4$

Question 3

Both parts of this question were well answered. Students who decided to work with 75% instead of $\frac{3}{4}$ were less successful. A common wrong answer was to work with $\frac{1}{4}$ instead of $\frac{3}{4}$.

Question 4

Both parts of this question were well answered.

Question 5

Part a was very well answered, with students easily able to identify the parallel lines. When plotting the points in b, it was common to miss off the points that lie on the axes (one or both) or to plot the four points at (0, 0), (1, 1), (2, 2) and (3, 3). Students who joined their points to form a line were not penalised, but this was not a requirement of the question.

Question 6

All parts of this question were well answered.

Question 7

This was a well-answered question with the usual error being repetition in part a, often by transposing the letters, so it wasn't immediately noticeable. Part b was also done well with the misconception sometimes that we were asking how many small or large portions you'd need in order to have 44 dough balls. The most reliable method was to list the multiples of 6 and 10, and find the correct combination from there.

Question 8

This question was very well attempted and had a good spread of marks. Most students reached the answer of 12 but there were sometimes arithmetic errors in their build-up method, or in their calculation of 9×25p, which meant the accuracy mark couldn't be awarded. Students who worked out the £7.75 and matched that to the nearest multiple of 60p usually fared better than those to tried to build-up to £10 from £2.25

Question 9

Part a was answered much better than part b. Students were more comfortable calculating the median than the range. The range lying between 20 and 22 was a source of some doubt for students and we saw of answers of 20, 20 and 22 or 22, instead of 21

In part b, students did not know that a smaller range was the measure they were looking for. Many students were commenting on the mode or the median or making a reference to Sue's 31 goals being an outlier.

Question 10

The vast majority of students were able to start this question and score at least one mark by correctly finding 10% or 50%. Error usually appeared when trying to find 5%, from their 10% (or 50%). The finding of 10% and building from there was a common approach, as was 10% + 25%. It was less common to see 0.35×1200, but when seen, it was usually successful. Students who did not show their working (and made an error) usually lost out on a second mark.

Question 11

Both parts were well attempted. A common error in part a, was to simply write in the 6, in pace of the W, giving $26 + 5$.

Another common mistake in part a was to add the 6 and then 5, before doubling.

In part b, the most successful method was to work backwards and realise that you cannot clean 9.5 windows. Students who worked out that every cost had to be odd, failed to mention that 24 is even and so cannot be a cost. Many students calculated £23 or £25 but not both, which didn't show that £24 cannot be a cost.

Question 12

Students showed a good understanding of proportion, with the majority converting $\frac{2}{5}$ to $\frac{8}{20}$ and scoring 2 marks when identifying that Y had the greater proportion. Students who tried to convert each fraction to a decimal usually only got one accurate answer, so were unable to score both marks. Attempts at solving by drawing a diagram were usually unsuccessful.

Question 13

Part a was a routine ratio question, and answered quite well. The most common wrong answer was to divide 180 by 3 instead of by 4

In part b, the most common wrong answer was $\frac{5}{9}$, from not adding the 5 and the 9 for the denominator.

Question 14

Part a was well answered with the majority of students using the table to find the answer. The usual problem that students encountered in part b, was to misplace the decimal point. Part c saw most students start to calculate using long multiplication, instead of adding/subtracting values from the table. Those who did try to use the table often used the 66 row instead of 63

Question 15

Students showed good knowledge of congruence on this question.

Question 16

Students engaged well with this question and the different rows showed a good differentiation of marks.

Question 17

Obtaining 29 was often the only mark some students scored. Those realising that 29 was the second term and the difference was 19 usually ended up with 86 but most used 29 as the difference and worked from there.

A Fibonacci sequence with an answer of 107 (10, 29, 39 …) was common. Another common error was starting at 10 and adding 29 leading to an answer of 126. Very few attempted to use the formula.

Question 18

This question was not particularly well answered with the majority of students forgetting to halve, once they had multiplied the 20 by the 6.3

Working with decimal often lead to arithmetic mistakes or place value mistakes and very few students spotted that the 20 could be halved immediately, making the 6.3 easy to multiply by the 10

Question 19

It was most common to see students switch the places of the 3 and -7, rather than give each number its opposite sign.

Question 20

This upper/lower bounds question was not well answered. Common, incorrect answers were 8300 and 8500 or 8499.

Question 21

It was really pleasing to see a question at this stage of the paper be well attempted and well answered. Points were well plotted and nicely joined in part a, and students were able to give sensible estimates in part b, either from their graph or from the original data. The only commonly occurring error was to misread the vertical scale in part a and plot at 64 instead of 62

Question 22

In part a, many students scored well by correctly stated that she used the height instead of the slant height or she used the vertical height, or she used 12

Part b was not well answered with many students missing the fact that the base was a circle, and instead, reusing the formula given in part a. It's worth noting that students were given the formula for the area of a circle this year, so it was simply a case that they hadn't "seen" the circle, rather than they didn't know the formula. Many students who attempted to use the formula, multiplied 3 by 5 first of all, and then squared.

Students were more successful in part c, being able to spot that Beth's estimate of pi was larger than Adam's. Weaker students merely reworded the question and gave answers such as "Adam used 3 and Beth used 3.14"

Question 23

Students used a variety of techniques to answer this question. Many found the amount of milk needed for one day, but struggled to calculate $\frac{3}{4}$ of 30. Many would multiply both numerator and denominator by 30 resulting in an answer of $\frac{90}{120}$. A number of students made errors when adding $\frac{1}{2}$ and $\frac{1}{4}$ resulting in an answer of $\frac{2}{6}$.

Question 24

This was a routine question and the usual mistakes were made. It was common (as is often the case on these questions) for $4x$ to be added to $7x$, or 22 to be subtracted from 29. If one had been done correctly, however, there was still the chance to score a second mark by following through their resultant equation, although their resultant equation often involved decimals which the students were unable to process correctly. We still saw students attempting to solve this by a trial and improvement method, with varying degrees of success.

Question 25

Just over one quarter of students were able to correctly place the decimals, before beginning to manipulate away the decimals and simplify. The most common, final answer was $\frac{13}{8.2}$.

Question 26

There was a lot of uncertainty surrounding the shading of the circles in part a, on this question, with many students “hedging their bets” and shading one circle. Some students were drawing the circles just before the -2 and 4, so as to be “less than” in each case. Other common errors were to draw lines without circles or to just circle the two numbers on the given line.

In b, it was common to get as far as $5y \geqslant -3$ and then go awry. Errors commonly seen included flipping the fraction (because of the negative), flipping the sign (because there was a negative somewhere in the inequality) or losing the $y \geqslant$

As is often very common, there were a number of students ignoring the inequality sign and replacing it with an equals sign.

Question 27

Students were invariably unable to recall and identify the relevant transformation. A small number recognised the shape had changed size, but were unable to state the correct scale factor. These would often use language such as "got bigger" or "changed size" without stating the word "enlargement". Many descriptions involved area or the vector from one corner to another.

Further support

Mark ranges and award of grades
Grade boundaries and cumulative percentage grades are available on the results statistics page of our website.

Enhanced Results Analysis (ERA)
Use our exam results analysis tool to create and customise as many different reports for comparison as you like.

Professional development
Attend one of our feedback courses where you can review example responses from students and commentaries from our examiners.

Contact us

Our friendly team will be happy to support you between 8am and 5pm, Monday to Friday.

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