Questions matter

GCSE
Mathematics
8300/1F Paper 1 (Non-calculator) Foundation
Report on the examination

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Contents

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Summary

Overall performance compared to last year

There was very little difference in the performance this year, compared to last year, with the mean score having increased by a little more than one mark.

Topics where students excelled

- Sequences
- Primes, factors, multiples, square numbers
- Pictogram
- Interpreting a line graph in a real-world context
- Ratio and simple probability
- Explaining why the radius of a sphere is 10cm, given the diameter of 20cm

Topics where students struggled

- Working backwards from an answer and remainder to find the original number
- Calculating the volume of a sphere
- Standard form
- Recalling the value of sin 90°
- Finding the length of one side of a rectangle, given the area and two algebraic expressions for the lengths of the sides.

Individual questions

Question 1

Very well answered overall but when incorrectly answered in part (a) the answer was often +3, giving us the term-to-term rule rather than the next number in the sequence. Part (b) showed no particularly common wrong answer and on (c) the arithmetic was the usual source of error. In (d) sometimes the multiplication went awry and sometimes the negative sign was missing.

Question 2

Again, this was very well answered. There was no particular wrong answer in (a) or (b) but in (c) the most common wrong answer was 27. For (d), the most common wrong answers were 8 and 32.

Question 3

The most common method was to work out what each quarter of the circle must be worth in order for the 2 circles for Close to be worth 48. Errors were seen in division or counting up in 6s. Those who showed their working usually scored better than those who simply listed interim figures.

Question 4

(a) was well answered but when the answer was incorrect it was because the axes were being used the wrong way around. In (b), students often stopped after doubling or reading off at 10, not remembering to add on the 10. It was not uncommon to see the 8 being multiplied by 10.

Question 5

We saw a huge proportion of students adding the 5 to the 43 to then attempt 48 x 8, showing no understanding of the remainder. Those who multiplied 43 by 8 (achieving 344 or not) often did not know what to then do with the 5. The other common mistake was to treat the 5 as 0.5 and multiply 8 by 43.5

Question 6

Many students were awarded a mark for 200 × 4 = 800 but then struggled to progress further: it was common to see 800 in the company of 200 × 5 = 1000. Many students proceeded to find the difference between these numbers which was of no use to them. Some students used a trial and improvement approach to obtain their answer. Unfortunately, many of these responses contained arithmetic errors.

Question 7

The majority of students understood how to approach this question and made a good start on (a) and were largely successful in (b). The most successful method was to work out the total price needing to be paid and then list multiples of 8 until sufficient had been reached. Those not achieving full marks had usually made an arithmetic slip in the divisions or multiples. It was common to see that half of 25 is 12.1

Question 8

Many students understood how to start the question but were often unable to process the division correctly. Other than incorrect divisions, the most common incorrect answer was to see 6 x 170 because food for 6 more people was required.

Question 9

In (a), the addition for Box A was more accurate than for Box B. Many students who reached 20 and 25 simply left the answer as 20 : 25, forgetting the need to simplify the ratio. It was quite common to see an answer of 5 : 8, giving the number of discs in each box as a ratio.

Part (b) saw common wrong answers of 1 : 5, 1 in 5 or $\frac{8}{20}$

Question 10

Students completed this question with varying degrees of success. Many were able to correctly substitute one value and score the first mark: quite often this was for 4^2 or 16. A common error saw students 'substitute' 4 into $3a$ and obtain the result 34 instead of 12. This was another question where students who showed their working scored better than those who did not. For example, a student writing $2(16 + 3 \times 4) = 2 \times 16 + 12 = 44$ would score more marks than the one simply writing $2 \times 16 + 12 = 44$. It was pleasing to see very few students still had an 'a' in their final answer.

Question 11

The majority of the responses correctly used the given line as the diameter but 'circles' were often drawn freehand which would not be awarded any marks. Centres and students are reminded that even on a non-calculator paper, they must bring a ruler and a pair of compasses.

Question 12

The arithmetic of (a) proved tricky for many students, although most were able to score at least one mark. The most common first step was to divide 240 by 8 (usually successful) but then multiplying the 30 by 350 was where many went wrong, with the final zero often missing. Those who started by converting $\frac{1}{8}$ into a decimal before multiplying, or those who divided 350 by 8 first, were mainly unsuccessful. Overall, (b) was well attempted but we saw the usual

mistakes of dividing by 3, 5 and 2 by the less able students and there were still students who forgot to choose their value, once they'd calculated all three amounts. It is worth students checking whether the question asks for all of the amounts in the ratio or just one component.

Question 13

This question was well attempted with many students scoring 2 or 3 marks. The reason for the final mark being lost was often that they had calculated the 53 but chosen 106 as their final answer. Those not scoring had usually started with 360 – 74. It was not uncommon to see 106 × 2.

Question 14

Most students were able to score a mark for correctly rounding a number. A good number of students were able to score 2 marks for correctly rounding all three numbers, but the order of operations was problematic for many. More than one third of students were able to give a valid reason for the estimate being an overestimate but there was need to reference rounding "all" of the values, not just answering "I rounded up".

Question 15

We saw lots of good work in (a) but those who drew a diagram needed to include a worded explanation too. In (b), the students who understood how to substitute into the formula and scored a mark for 10^3 or 1000 were almost always unable to process the 1000 and $\frac{4}{3}$ together. Leaving π as π felt uncomfortable for many.

Question 16

Students were able to place the given values correctly into the formula in (a) and many were able to process correctly. When things went awry it was because the student was unsure how to start and had multiplied the 800 and the 20. (b) was well understood with most students choosing the bottom option. The most common wrong answer was to choose the top option, following that 'fewer' from the question would mean 'less' for the answer.

Question 17

This was not well answered. Twice as many students chose an incorrect option and each of the incorrect options were chosen a roughly equal amount of times – no one option stood out as being the most common choice.

Question 18

Whilst a good proportion of students knew to multiply 11 by 8.5, half of them were unable to process the calculation, answering often with 88.5 or (less frequently) 935, being unable to situate the decimal point. Some students tried to cube 11 or 8.5 because of the cubed units in the question.

Question 19

This is still a topic that students don't find easy. They aren't able to interpret the meaning of smaller/larger means/ranges in context even though they are perfectly able to perform the calculations. It was not unusual to see them changing their minds (not always for the better). The most correctly answered row was the bottom row.

Question 20

It was common to see the interim 0.006 in (a) but then the students stopped there or incorrectly performed the conversion to standard form. It was not common to see a fully correct answer to (b) although many made a start. The students who converted the 10^5 to 100000 and then multiplied usually dropped a zero or two and could only score for a correct conversion of their number to standard form. Conversion of the 40 and 30 to standard form and then addition of powers was a 'safer' way to tackle the question.

Question 21

The most commonly seen answer was the perfect net of an open cuboid. Few students attempted to include the 6th face. It was pleasing to see very few attempting a 3D picture. The most common wrong answer was for the students to draw 2 rectangles beneath the given shape, each the same size as one another. This would score if the upper of their rectangles was the 5x2 kind but not if they'd drawn two 5x3 rectangles because neither would be a correct face in a correct position.

Question 22

The frequency tree was well attempted. The most common error was to divide the 330 by 2 (two branches) and work with 165 on each branch. 52 and 73 were usually in the correct positions, so students could go on to score from their values with these two.

Question 23

The addition part of the solution was often answered but many students did not attempt to follow the correct order of operations. A number of arithmetical errors were seen when trying to convert fractions to a suitable common denominator. Dividing by a half proved challenging for many. A common error seen was trying to divide by the reciprocal. A number of students started their division by converting their fractions to ones with a common denominator; this is a valid method but most students attempting this method were unable to move forward from that point.

Question 24

This was not well answered with a split across options 1, 2 and 4. No doubt the fractions caused issues when students attempted to order the answers after substituting them into the equation.

Question 25

This was not well answered with more students incorrectly choosing option 3, than the correct answer of option 4. A similar proportion to those choosing option 4, chose option 2.

Question 26

Students who put thought into a purely numerical approach, using factors of 120 were mainly successful. Whilst students found this tricky, they were able to score a mark or two for multiplying the sides together even though they were unable to factorise or solve the quadratic in any way. Those who attempted to use Trial and Error were usually unsuccessful. It was not uncommon for students to work with perimeter instead of area.

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Contact us

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

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