Questions matter

GCSE

Mathematics

8300/2F

Report on the Examination

November 25

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Summary

Overall performance compared to last year

The majority seemed to be well prepared for the paper and equipped with everything they needed, although a significant minority did appear to be lacking a calculator.
The overall performance of students was very similar to June 2025

Topics where students excelled

- Finding the next term in a sequence
- Solving a money problem
- Solving a rate of pay problem
- Simple probability

Topics where students struggled

- Working out a map scale
- Graphical simultaneous equations
- Congruent triangles
- Circumference and speed, distance, time

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Individual questions

Question 1

Students generally managed a good start to the paper with over 90% gaining full marks. When only one was matched correctly it was usually either Length to Metre or Time to Second.

Question 2a

The vast majority were able to write the coordinates of point A correctly. Common errors were to write the coordinates the wrong way around or give the coordinates of the point missing from the rectangle.

Question 2b

This was generally very well answered with approximately two thirds gaining the mark. Although some students knew they had to multiply 4 by 2 they were not able to do this successfully. Others thought they needed to work out half the base multiplied by the height or added the lengths of the sides together.

Question 3a

Fairly rare to see an answer other than 34. Occasionally an error was made when adding 6 to 28.

Question 3b

Very well answered by the vast majority. Occasionally an error was made when adding -11 to 7 and occasionally students worked from right to left and gave the answer 51.

Question 3c

Approximately three-quarters of the cohort correctly stated the answer 15. The sequence of Triangular numbers seemed to be fairly well-known to students and those who weren't too familiar with them usually used the differences between the terms successfully. Occasionally arithmetical errors were made in either working out the difference between the terms or in adding the next one on.

Question 4

About one quarter gave all three correct responses, and just under two-thirds were awarded 1 mark, with the final statement, 'A triangular based pyramid has 6 edges' being most commonly answered incorrectly.

Question 5

The vast majority knew how to write the probability correctly. Common errors were to give the answer $\frac{1}{100}$ or 0.07%. Other errors seen were to involve 93 or 107 in a fraction or to give the answer as a ratio.

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Question 6

Almost two-thirds were able to place the correct rectangle in the correct position. When one mark was awarded, it was usually for moving the correct rectangle either 2 squares down or 4 squares to the right. Some students changed the shape.

Question 7a

Less than half the cohort were able to convert both correctly. The percentage caused more problems for students than the fraction. The most common errors made in the percentage were to give integer answers such as 87 and 88 or to misplace the decimal point and give answers of 875 or 0.875. For the fraction the most common errors were to give 3/20 or 100/150 as the answer.

Question 7b

Just under a half were awarded full marks. It was very common for students to include 1 as a prime number or list the odd numbers 3, 5, 7, 9. When students were awarded no marks it was usually for giving the set of even numbers 2, 4, 6, 8

Question 8

This question was correctly answered by just over 80% of the cohort. Even those without a calculator usually managed to do well in this question. When students didn't gain full marks it was often because they didn't use correct money notation when stating their answer. Some missed out one of the steps, sometimes this was multiplication by 4 and working out £1.25 + £3.20 = £4.45, and sometimes it was division by 2 and working out £10 + £3.20 = £13.20, Occasionally the 'Sandwich' offer was not understood and students worked out one full price and several at half price.

Question 9

The vast majority knew what to do here, when full marks were not awarded it was often because they had worked in pounds and not converted to pence at the end, giving the answer 0.38. It was also quite common for students to stop work at £1.52 or 152p. Those without a calculator often struggled with build up methods.

Question 10

This was well done by the majority, with just over two-thirds of the cohort being awarded full marks. Almost all students were able to find 20% of 120 successfully, from this point the majority then went on to multiply up by 4 to find the number of towels and then subtract 85 with arithmetical errors being the only real cause of any loss of marks. Those who chose to divide 85 by 4 were usually unsure what to do with the decimal answer and often ended up with 3 rooms or 12 towels. Some thought they were required to take 20% off 120 and multiplied 96 by 4 whilst others mixed up the number of towels and the number of rooms.

Question 11a

The vast majority chose the correct option. Those not choosing the correct option were divided between 'go straight ahead' and 'cannot tell'.

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Question 11b

This was found difficult by the majority of the cohort with less than half gained any marks in this ratio question. The rounded answers of 4:2:0 and 4:2:1 were very common. For those who did try to multiply up to gain whole numbers the decimal 0.1 caused more issues than the other values with 35:18:10 being quite common. Students often included a '%' symbol with their numbers. One successful approach was to multiply all the values by 100 to gain the answer 350:180:10

Question 12

This question was generally very well done. The vast majority gained the correct answer from using an arithmetic approach rather than an algebraic approach. Common errors were to give the answer 5+10+30 without evaluation and to work out $30 \div \frac{1}{3}$ instead of 30 ÷ 3. Some misunderstood the question and took $\frac{1}{3}$ off 30 finding the values a and b as 10 and 20. Some worked in reverse for all calculations and found 90 for b and 180 for a.

Question 13

Approximately one-third of the cohort was able to draw a right-angled triangle with area 12 cm^2. Common errors were to draw right angled triangles with height 2 cm or 6 cm, or to draw non-right-angled triangles with height 4 cm. Some drew rectangles. Almost all used the line provided.

Question 14a

This was very well answered, with approximately 80% being awarded full marks. It was quite common for students to correctly work out the pay for Saturday and either stop there or add on £14, the hourly rate of pay, instead of the pay for Friday. It was quite common to assume the pay for the two days was the same and double £98 or to think the rate of pay was £98 and work out (£98 × 7) + (£98 × 4) = £1078

Question 14b

The vast majority chose the correct option, with the next most common option being that it is not possible to say.

Question 15

The vast majority were awarded 1 mark as they thought that the shaded section was a segment having chosen the correct responses for the first two statements. Just under 10% of the cohort chose the correct response for each of the three statements.

Question 16a

Just over one third of the cohort chose the correct responses for all three statements. It was common to choose the incorrect response for one of the second or third statement.

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Question 16b

Less than one-third of the cohort stated No and gave a valid reason. The best responses stated a valid value for the number of pigs in farm B that was higher than any possible value for the number of pigs in farm A. It was quite common to just repeat information from the question and refer to the nearest 10 and 100. It was also quite common to incorrectly state the maximum possible number of pigs for farm A as 635 and that for farm B as 650.

Question 17

This question produced a good spread of marks. A large variety of approaches were used by the students, but the most commonly used successful routes were with alternative methods 1, 2 and 6. Those attempting to compare the total volume of mixture needed with the maximum available often got as far as 1920 ml needed and 500 ml without making the final step. Common errors were starting with 0.5÷4, 320÷6 and using 100ml as 1 litre.

Question 18

This question produced a good spread of marks. Where students were able to find both probabilities they often struggled to find the number of Green discs with many stating there were 20, 200 or 225 of them. It was quite common for students to think the probabilities had to be halved giving the probabilities 0.15 and 0.075 with 30 for the number of Green discs. The majority knew that the probabilities should sum to 1, and answers such as 0.2 and 0.5 or 0.6 and 0.1 were commonly stated to go with the 0.3 given in the table.

Question 19

Just over one third of the cohort were able to correctly find the perimeter of the rectangle and substitute it into the formula correctly. Those who were not able to correctly find the perimeter of the rectangle often either found the area or just added the two given sides. When attempting to use the formula common errors were to add 16 to $\frac{7}{10}$ and then either multiply this by their perimeter or to add it to their perimeter. It was quite common for students to gain 1 mark for either being able to find the perimeter or being able to use the formula.

Question 20a+b

It was rare to see a completely correct solution to part (a). Rather than adding the losses from the first two years and then accumulating the profits from following years students often compared the loss from the first year with individual profit values from the years following. Many students found it very difficult to use the scale correctly, the first loss value was sometimes stated to be -22, -26, -34 or -36 and sometimes differences between values were found. It was also quite common for students to think the graph showed cumulative figures. It was also quite rare for students to gain the mark in part (b) due mainly to stating a value between 39 and 60 completely ignoring the thousands.

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Question 21

It was very rare to see a correct solution to this question. 35 × 2 = 70 and 35 ÷ 2 = 17.5 were very common responses. Those who did attempt conversion of units often did so incorrectly mistakenly using 100 m = 1 km

Question 22

The majority did not fully understand what was required. It was very common to rotate the given shape 90° about a point other than (5, -1), often this was (5, 2). It was also common to see the rotated shape with vertex at (5, -1). Some rotated 180° about a point and some translated.

Question 23a

Approximately one third of the cohort stated the correct formula for the nth term of the sequence. Many recognised the differences between the terms as +7, but then gave this as a term in their formula, n+7 was a common example of this. Some thought the next term was required and gave the answer 36, sometimes this was after finding the correct formula. Other common responses were 7n-1, 7n+36 and 8n. Very few had poor notation, such as n7.

Question 23b

The majority found this difficult. One common error was to find the first term above 100 and give 101 as the answer. Another was to substitute 100 into the formula and give the answer 197. It was fairly common for students to list the terms in the sequence and then miscount.

Question 24

The majority did not recognise that they needed to give the x and y values of the point of intersection of the two lines. A common error was to give the values 1 and -1

Question 25

Less than 5% chose the correct pair of triangles. The most commonly chosen pair were triangles A and B.

Question 26

Students struggled to understand the inequality. Most attempts involved trying values in the inequality, with 6, 8, 10 and 6, 7, 8, 9, 10, 11, 12 being common ways to gain 2 of the 3 available marks. When students did attempt to rearrange the inequality they often worked only on one of 4 or 11 rather than both.

Question 27

Finding the mean for grouped data is always a difficult topic for Foundation tier students. It was quite common to find the sum of the correct products then divide by 4. Some added the number of people to the number of flats to find a total of 46 so that 46/4 and 46/36 were seen in the working area.

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Question 28

This question produced a good spread of marks and completely correct solutions were produced by approximately one quarter of the cohort. It was quite common to start correctly finding 1/3 of 225 and 3/5 of 975 and add them together but then not be able to find this as a percentage of the total number of students. Some struggled to find 1/3 of 225, attempts often included using 0.3 or halving then halving again. If they did not gain any credit, it was often due to them adding the fractions given in the question as first step.

Question 29

Very few were able to access the marks as they were unable to find the circumference. It was very common to give 2.5 as their answer from dividing 15 by 6. It was also fairly common to find 15π and then multiply by 6 rather than divide. Some thought it necessary to double the radius as the first step.

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