GCSE

Mathematics

8300/3F: Paper 3 (calculator) Foundation

Report on the Examination

November 2025

Version: 1.0

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Summary

Overall performance compared to last year

There was no evidence of time pressure with most students able to complete the whole paper. Some of the questions that were common with the Higher tier proved challenging for students on this tier. Students were rewarded for good use of mathematics shown at different levels of ability. Students did not always show working when instructed to do so and some used non-calculator methods, particularly in percentage questions.
In general, students performed similarly on this paper to that in November 2024.

Topics where students excelled

- Linear equations
- Probability from a spinner
- Listing outcomes
- Composite bar charts
- Direct proportion
- Scale Drawing
- Coins problem solving
- Number machine
- Critically evaluate a pictogram
- Division problem solving
- Substitute into an expression

Topics where students struggled

- Proportion problem solving
- Bearings
- Square number and cube number problem solving
- Fraction and percentage ratio problem solving
- Term to Term rule with algebra
- Right angled trigonometry to work out a side with sine
- Density calculation and units
- Relative frequency and probability
- Equation of a line given gradient and intercept

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Individual questions

Question 1a

This simple linear equation was answered very well by the very large majority of the students.

Question 1b

This simple linear equation was answered very well by the very large majority of the students.

Question 1c

This simple linear equation was answered very well by the very large majority of the students.

Question 1d

This linear equation with negatives equation was answered very well by the very large majority of the students.

Question 2a

This probability from a spinner question was answered very well with some students giving incorrect answers of 0.3 or 33%.

Question 2b

This listing outcomes question was answered very well with some students repeating combinations.

Question 3a

The very large majority of students answered this calculating from a composite bar chart question very well with some showing 11 and 21 without stating Mike as 10 wins, it was common for students to not link the values of 11 and 10 with Lee and Mike respectively.

Question 3b

A reasonably well answered question. The most common incorrect responses were drawing a bar of height 12 divided into 9 and 3, calculating 8 ÷ 3 and attempting to divide a bar of height 8 into 2.7 and 5.3 or 5 and 3. It was relatively common for the correct sized sections to be drawn the wrong way round or to draw only one section correctly.

Question 4

The very large majority of students answered this direct proportion question very well with some making an error in multiplying by four using a build-up method without a calculator whilst others incorrectly worked out the cost for the remaining nine months.

Question 5a

A not very well answered proportion question. The most common incorrect answer was $\frac{5}{3}$ or 1.6 with many students showing choice on the answer line with $\frac{3}{5} = 0.6$ or a decimal fraction $\frac{0.6}{1}$.

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Question 5b

The large majority of students answered correctly with the most common incorrect method being $0.6 \times 18 = 10.8$ with an answer of 11. There were also some incomplete methods with $18 \div 3$ with an answer of 6 or 5×18 with an answer of 90.

Question 5c

A not very well answered proportion problem solving question. Many students who followed a correct method of $3 \div 5 \times 12 = 7.2$ then did not understand that eggs were discrete leaving 7.2 as their answer. A large number of students made statements rather than calculations eg $3L = 5C$, $6L = 10C$, $1L = 1C$ with an answer 7 and others incorrectly combined cakes and lemons with $3L = 5C$, $6L = 10C$, $1C = 0.6L$, $2C = 1.2L$ then $10 + 1.2$ with 11.2 as their answer.

Question 6a

A reasonably well answered bearings question.

Question 6b

The very large majority of students correctly answered this scale drawing question very well. The very large majority of students correctly identified 4 squares between the Bank and the Cafe some students incorrectly counted showing 5×300 with 1500 as their answer.

Question 6c

This bearings question was poorly answered with a large number of non-attempts.

Question 7

A well answered coins problem question. Some students who did not answer correctly achieved a total of £9.50 without using 8 coins or worked with 8 coins but did not achieve a total of £9.50. The most common incorrect answers were 4 £2, 1 £1, 1 50p or 2 £2, 3 £1, 5 50p for £9.50 and 2 £2, 2 £1, 4 50p for 8 coins.

Question 8a

This number machine forwards question was very well answered.

Question 8b

This number machine backwards question was very well answered. The most common incorrect answer was 23.5 from incorrectly applying BIDMAS using a calculator to work out $25 - 3 \div 2$ instead of separate calculations of $25 - 3 = 22$ and $22 \div 2 = 11$ some students incorrectly used 25 as the input value.

Question 8c

This number machine question using x as the input was well answered.

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Question 9

This AO2 question on critically evaluating a pictogram was answered well by the majority of students. The most common error was for students to repeat mistakes for the wrong number of apples eg stating both $2 \times 4 = 8$ not 10 and there are 28 children not 30. Many students did not mention that each fruit had a different symbol and there were irrelevant statements written eg no title on the side of the pictogram, she didn't write favourite next to the fruit names. Some students incorrectly stated drawing a bar chart instead of a pictogram.

Question 10

This AO3 division problem question was very well answered. Misconceptions were to use 20.5 as their number of coaches or to incorrectly round 20.5 to 30 or 20 for the number of coaches.

Question 11a

This substitution question was well answered. Common errors included correctly working out 9 and 14 but then not using a calculator to work out $9 - 14$, difficulty with substituting $c = -7$ into $2c$ with a common incorrect response of $3^2 + 2 - 7$ followed by $9 - 5 = 4$.

Question 11b

A reasonably well answered question involving rearranging a simple formula with a significant number of non-attempts. Some students simply swapped a and b to answer $b = a - c$

Question 12

This proportion and money question as reasonably well answered although there were a significant number of non-attempts. The majority of students achieved 32 or 0.32 but most did not indicate a unit or used the wrong units with the most common incorrect answer being £32. There were a significant number of partial responses without using the 80p with $200 \div 5 \times 0.01 = 0.4$ without further work. Some students used a build-up approach, but these were rarely successful.

Question 13

This ratio deductions question was reasonably well answered.

Question 14a+b

The square and cube A03 problem question was not well answered with a large number of non-attempts. Students were more confident in identifying square numbers than cube numbers. Some students listed squares and cubes but did not identify the correct answer with 81 shown as a common incorrect answer. The method of applying the cube root of a square number or the square root of a cube number was seldom seen.

Question 15

This ratio question was answered reasonably well. The most common error was $72 \div 9 = 8$ followed by $8 \times 5 = 40$.

Question 16

The A03 problem solving question involving fraction and percentage ratio calculations was not well answered. The two most common misconceptions were initially calculating $\frac{3}{5}$ of £810 with an answer of £525.80, £810 – £380 = £430 as the money Mo gave to charity with an answer of £673

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or correctly achieving £1350 as their total money but then calculating 45% of £1350 with an answer of £987.50. Many students correctly achieved £540 as Nik's share but were then unable to calculate 45% of £540. Build-up calculations were frequently seen but rarely successful.

Question 17

This expand and simplify expression question was answered reasonably well however many students attempted to solve the expression. Common incorrect answers were incorrectly expanding the first bracket as $10x + 4$ or $10x + 9$, multiplying $3x - 6$ by 5. Some had difficulty collecting negative terms incorrectly showing $10x + 20 + 3x - 6$ as $13x - 14$.

Question 18

The very large majority of students were unable to work with algebraic expressions in the term to term sequence and the question as very poorly answered. Common incorrect answers were to substitute a numerical value for b, soley to add 7 with second term $3b + 2$, double the $3b$ and add 7 with second term $6b + 2$, some students had difficulty collecting negative terms incorrectly showing $6b - 10 + 7$ as $6b - 17$, others omitted brackets in their working with $3b - 5 \times 2 + 7$ proceeding to $3b - 10 + 7$.

Question 19

This ratio and angles in a quadrilateral A03 problem solving question was answered reasonably well although many students used 180° for the angle sum of a quadrilateral. There were a very large number of non-attempts. Common incorrect answers were 72° from $2 \times 3 \times 3 \times 4$, 48° from 12×4, 60° from using 12 parts = 180°, 126.7° from using 12 parts = 380° and 180° from using 12 parts = 540°.

Question 20

A significant number of students correctly answered this Pythagoras question although there were also a significant number of non-attempts. A very common misconception in this question was attempting a trigonometry approach with use of sin and $\frac{6}{14}$.

The most common error was $6^2 + 14^2$ or $36 + 196 = 232$, a number of students incorrectly rounded with an answer of 12.7.

Question 21

A minority of students correctly answered this work out a length in a right-angled triangle using sine question and there were a large number of non-attempts. Common misconceptions included attempts at Pythagoras, angles in a triangle with $180 - 90 - 25 = 65$, calculating $x = 5 \times \cos(25)$, incorrect variations of a sine calculation were also seen including $x = 25 \times \sin(5)$, $\sin\left(\frac{5}{25}\right)$ and use of $\sin^{-1}$.

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Question 22a

A very small minority of students correctly answered this AO3 density and units problem solving question and there were a large number of non-attempts. The most common errors were incorrect attempts at calculating the volume of a cylinder with volumes given as $7.6 \times 2.5 = 19$ or $7.6 + 2.5 = 10.1$, many incorrectly using density = mass × volume.
A very large majority of students did not state the correct units for density.

Question 22b

This evaluate result due to rounding question was poorly answered.

Question 23

The very large majority of students did not answer this relative frequency and probability A02 question well and there were a significant number of non-attempts.
Many students correctly identified 173 or 54 or $\frac{1}{6}$ but were unable to proceed further, some achieved 1211 or 54 and 173 but ticked No to indicate the dice was not biaised.

Question 24

This equation of a straight line given the gradient and intercept question was not well answered and there were a large number of non-attempts.
Common incorrect answers included $2x + 3$, $3x + c$, $x + 3$, $2 + x$, $2 + 3$, 3×2, 6 or 2.

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