

GCSE MATHEMATICS

8300/2H: Paper 2 (Calculator) Higher

Report on the exam

November 2022

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Summary

Overall performance compared to last year

The overall demands of the paper were similar. The earlier questions were a little more challenging and there were more questions requiring explanations.

Topics where students excelled

- selecting the answer to a calculation involving a power and a square root
- selecting the answer to a standard form calculation
- selecting an expression
- calculating using a percentage bar chart
- showing a calculation that represented a given situation.

Topics where students struggled

- working out highest common factor
- working out values for the edges of a cuboid
- working out a triangular number
- analysis of the spread of data
- composite function and inverse function
- estimating mean from a histogram
- vector proof
- probability involving algebra.

Multiple choice questions

Which questions did students find most accessible

The opening four questions were all answered very well.

Which questions did students find least accessible

A significant number of students chose $36a^2$ in Question 8(b) but more did choose the correct answer. Question 15 was the least well done with the modal answer being option 3. This was the only question where the most popular choice was not the correct answer.

Common misunderstandings

In question 6(b) many students ticked Yes and gave a reason involving the heights of the coffee bars on the diagram.

In question 8(a) many students did not understand that a cuboid has 12 edges.

In question 13 a common error was to use addition instead of multiplication when considering the relationship between sides in similar triangles.

In question 21(b) some students thought that the reciprocal of f was the same as the inverse of f .

In question 23 many students thought that frequency density was the same as frequency.

Individual questions

Question 5

This question was not well answered with many students seeming to be unfamiliar with an appropriate method.

Question 6

Part (a) was answered quite well with many scoring at least one mark. Common errors included misreading the scales or giving 6% as the answer.

Part (b) was not answered as well although most students that ticked yes did give an appropriate reason.

Question 7

In part (a) some worked out square roots. Many were able to work out a cube root correctly but did not always go on to select 42 as the answer. This part was a good discriminator in the first half of the paper.

Many students gave an acceptable reason in part (b), usually by saying that -10 was also a possible value. Incorrect answers often referred to decimal solutions or just repeated information given in the question.

Question 8(a)

This question was not answered well. Many only considered three edges and could make no progress. The few students who realised there were 12 edges often went on to gain full marks.

Question 9

The two most common answers were 1224 and 1225 but the question was not answered well.

Question 10

Many students identified the common difference of 5 for the new sequence but this often led to an n th term of $n + 5$. Others thought the final answer was $5n + 3$. Some added $n + 1$ to $5n + 3$ and others made a sign error when subtracting. The alternative approach of working out the terms of sequence B was not used as often but did lead to a lot of fully correct responses. The question was a good discriminator in the first half of the paper.

Question 11

Part (a) was well answered.

Part (b) was quite well answered. The rate part was quite often correct after an incorrect number of minutes had been stated for the first part.

Question 12

A significant number of fully correct responses were seen but there were not many scoring part marks. The most common error was to include an extra side length of x in the perimeter.

Question 13

Students that started by using Pythagoras' theorem on the smaller triangle were generally more successful than those who started using similar triangles. Errors in using the scale factor were common with many adding 1.8 (from $6 - 4.2$) to 5.6 to work out EH . Others assumed that $EFGH$ was a square and did not use either Pythagoras or similarity. Quite a few students only worked out the area of triangle DEH . The question was quite a good discriminator.

Question 14

Many students obtained £11 000 but then could not make any further progress. It was common to see £137 500 being increased by 8% and continuing with this rather than subtracting the £137 500. A few students scored the SC2 after increasing by 8%.

Question 18

In part (a) a small proportion of students were able to score full marks. Some had a correct median but the quartiles proved more challenging with a wide variety of values used. Most who attempted a box plot had the correct structure.

Part (b) and part (c) were not well answered with a significant number not attempting (c).

Question 19

The most common errors in the formula were only having one root (using $+$ instead of \pm) and using $c = 5$

Question 20

This question was quite a good discriminator. A significant number of students scored full marks and others managed one mark, usually for a relevant fraction. Adding sets of three numbers instead of multiplying them was the most common error.

Question 21

In both parts the responses were mainly either fully correct or scored zero. In part (a) some worked out both $f(2)$ and $g(2)$, often going on to multiply these together.

In part (b) many thought the inverse function was the reciprocal of f . Both parts had a lot of non-attempts.

Question 22

There were a significant number of fully correct responses. Some students could extract the factor x but many of these made no further progress.

Question 23

Part (a) was not well answered. The frequency densities were often seen in the frequency column. Part (b) was also not well answered. Many referred to the answer to part (a) being rounded or stated it could not be a decimal. There were a lot who made no attempt.

Question 24

A few students accessed at least one of the relatively easy opening two marks. Fully correct solutions were rare and there were many who made no attempt.

Question 25

This question was not well answered with a lot of non-attempts.

Question 26

This question was not well answered. Very few students understood that area under the graph represented distance.

Question 27

This question was not well answered. Most of the correct answers came from trial.

Question 28

This question was the most accessible of the later questions. Some used the wrong angle in the sine rule and others used right-angled triangle trigonometry.

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)

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Contact us

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