GCSE

Mathematics

8300/2H: Paper 2 (Calculator) Higher

Report on the exam

June 2022

Contents

Contents	Page
Summary	3
Multiple choice questions	4
Individual questions	5
Further support	9

Summary

Overall performance compared to last year

There was an improved overall performance compared to June 2019. The questions that were common with 8300 2F were answered very well. Many students were able to make good progress on many of the later questions, with only Questions 20 and 28 proving to be especially challenging. Some students lose accuracy marks due to prematurely approximating values. Poor writing and not showing methods are other factors that affect the performance of others.

Topics where students excelled

- Recognising an inequality from a diagram
- Solving a linear equation
- Using cube numbers and prime numbers
- Working with the mean of five numbers
- Assessing the validity of an argument
- Working out the volume of a composite solid
- Working with a formula and ratios

Topics where students struggled

- Working out a percentage decrease in context
- Perpendicular lines problem
- Function notation
- Geometric proof

Multiple choice questions

Which questions did students find most accessible

Question 4 was the most successfully answered of the opening four questions.

Questions 1 and 3 were also well answered.

Questions 14(b), 17, 21 and 22 were all well answered.

Which questions did students find least accessible

Question 2 was the least well answered of the opening four questions.

Question 12 was not answered well with more students choosing option 1 than choosing the correct option.

Individual questions

Question 5

This question was answered very well. Some expanded incorrectly, usually to $10x - 1$ and some made sign or arithmetic errors when collecting terms.

Question 6

This question was answered very well. Some tried to take the cube root or the square root of 2125 and made no progress as a result.

Question 7

Many students gave a fully correct solution and a significant number scored two marks after getting to 29.5 minutes or 1770 seconds. 29.5 minutes was often converted incorrectly to 29 minutes 50 seconds. Although less common, 29 minutes 5 seconds was also seen. Some made rounding errors and lost the accuracy mark because of this.

Question 8

There were many ways to proceed in this question, but the most common and successful approach was to add the four given numbers and subtract the total from 90 × 5. The question was very well answered.

Question 9(a)

The common error was to give the frequency of 33 rather than the required relative frequency. Others worked out the reciprocal of the correct answer. Many correct answers were seen.

Question 9(b)

This question was well answered. Some students worked out 500 ÷ 120 but used a prematurely approximated value eg 4.16 and obtained a decimal answer.

Question 10

This question was very well answered. Nearly all students ticked the No box and the common error was to increase £25 by 25% rather than by the given 20%.

Question 11

Some students subtracted 16^2 from 30^2 instead of adding the two squares. Others either did not include the area of the triangle or omitted the $\frac{1}{2}$ from the area formula. There were many fully correct solutions.

Question 13(a)

Although some students worked out half the volume of the hemisphere, there were many fully correct solutions.

Question 13(b)

This question was challenging for this stage of the paper but was answered well by a significant number of students. Most success was from using the cube of the linear scale factor. A common error was to use 117 cm as the height of the actual cone. For those who divided volumes, premature approximation resulted in not gaining the final accuracy mark.

Question 14(a)

This question was well answered. Some estimated the given numbers but could still score method marks. Prematurely approximating from 1475 ÷ 2250 meant that some students did not get the required answer.

Question 15

Students who knew the meaning of product were usually able to score, often gaining both marks. Some put zero in the centre box, and this meant that many lines were incorrect. A significant number of students tried to make the rows etc add to 1.

Question 16(a)

Many students gave an appropriate criticism. Some did not understand the meaning of average and referred to the fact that the number of sandwiches sold each day would have been different. Another common error was to state that there were 31 days in June.

Question 16(b)

A common error was to divide £6660 by 20, and this usually meant that no marks were scored. A significant number of students were able to deal with the costs successfully and score full marks. Some correctly found the total cost of the meat and/or the cheese sandwiches but did not know how to proceed from there.

Question 18

There was an increase in the proportion of students who did not show a method and these students either scored both marks or no marks. Those who showed substitution into the quadratic equation formula sometimes used $c = 11$ or only divided the square root by 2.

Question 19

Many students correctly worked out the coordinates of *C* and/or *D*. Some assumed that *DE* was equal to *CD*, either ignoring or misinterpreting the given ratio.

Question 20

This question was not well answered. Many did a correct calculation for the first mark but often were unsure whether they should use it to make further progress and, instead, went down a different route. Some who did a fully correct method ignored the instruction to give the value of x to 2 decimal places.

Question 23

About as many students factorised correctly as failed to score.

Question 24

A challenging question for many students with quite a high number of non-attempts. Although the gradient of the line through (2, 8) and (6, 15) was quite often worked out correctly, many did not know how to use this to work out the gradient of the perpendicular line. Some thought that (2, 8) was a point on the perpendicular line.

Question 25

Working out the inverse function was quite often completed correctly although many just wrote the reciprocal of f(x) or used –f(x). Completing the simplification to an integer was challenging with only a small number of students getting full marks.

Question 26

Common errors included dividing 18.9 by 0.45^2 and dividing 48 by 0.25 instead of multiplying these. Overall, for this stage of the paper there was a very good response.

Question 27

Some students showed several calculations but did not make it clear which calculation they were using to show that the bedroom could be rented. Others only multiplied a lower bound by an upper

bound or only considered the calculation 2.4 × 2.9. However, there were quite a lot of fully correct responses and nearly all students made an attempt.

Question 28

This question was only accessible to a small proportion of students with many making no attempt at all. Those who did work out 150° and/or 30° and/or 120° did not always show a method. A small proportion of students wrote an excellent response.

Question 29

A significant number of students tried to complete the square with quite a lot of these doing so correctly. Errors included working out 9^2 as 18, using $(x + 9)^2$ and adding 81 to the square of a bracket. A few completed the square correctly but either did not have an answer or had a sign error in their answer.

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 supporting student exam preparation courses which aim to strengthen teacher confidence, in supporting students preparing for exams.

Contact us

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

Tel: 0161 957 3852

Email: maths@aqa.org.uk

aqa.org.uk