Questions matter

GCSE
Mathematics

8300/2H Paper 2 (calculator) Higher

Report on the Examination

June 2024

Version: 1.0

Contents

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Summary

Overall performance compared to last year

Students found the questions that were common to the Foundation tier more challenging than last year. Many of the questions in the middle third of the paper were answered well. This resulted in the overall performance of the paper being very similar to June 2023.
Most students were able to finish the paper and there were not many parts that had a significant number of non-attempts.

Topics where students excelled

- giving a reason why probability values are incorrect
- compound percentage increase problem
- identifying the reason for congruence
- problem involving rate, mass and time
- drawing a box plot.

Topics where students struggled

- problem involving a spinner and probability
- working out the best estimate for a probability including a reason
- identifying a change in a coordinate when a graph is a straight line rather than a curve
- identifying a change in a coordinate when a curve is exponential rather than reciprocal
- problem involving ratio, volume and surface area.

Individual questions

Question 1

Not well answered. More students identified sector for region B than segment for region A. Over a third of the responses scored no marks.

Question 2

This question produced a good spread of marks and was the best discriminator from the early questions. Most students left the standard form conversion to the end, but a significant number forgot or did not know how to do this. Many used 1.12 and some who identified 0.88 used it incorrectly, with a common error being $0.88 \times 2\,200\,000$

Question 3

Both parts were quite well answered and had a similar performance.

Question 4

Part (a) was either answered well or poorly with very few gaining part marks. Most tried to complete the spinner to help them, but mistakes were often made. Some had more than one number in the sections. If the spinner was fully correct the correct probability was usually also seen.
Part (b) was well answered. A common error was to say the given probabilities added up to 0.11

Question 5

Both parts were quite well answered. In (a) C was correct more often than D.
In (b) some gave coordinates rather than values for one or both answers. The first answer was correct more often than the second.

Question 6

A well answered question with most using correct notation.

Question 7

Nearly a half of students did not score any marks. Some thought the table had four different sets of results and worked out the relative frequency of each set. Some gave an integer value such as 52 or 200 and others thought the answer was 0.25.

The reason was sometimes correct even if the probability was wrong, but many explanations were wrong or poorly written.

Question 8

Quite well answered with most correct responses coming from $90 \div 5$
Some students used a time interval of one second and only a few used a non-integer time interval.
Most who scored 1 mark did so from the SC1.

Question 9

Quite well answered. The most common error was to shade P U Q.

Question 10

This was very well answered with most students using multipliers 1.03 and 1.08 and making a decision at the end. A few increased 90 000 by 11% and scored SC1 while others used a decrease by 8% rather than an increase.

Question 11

Most students scored at least one mark for one correct step. A significant number did not show sufficient working to be awarded two marks. Answers of 30 and 300 were quite common.

Question 12

This question was very well answered.

Question 13

A well answered question with many fully correct responses.
fx values were quite often seen with no method which did not matter if the fx values were correct.
Some students round values at various stages and this stopped them gaining further marks. For example, after the correct fx values are obtained (110 + 140 + 60) ÷ 40 is seen.
Another common error is to divide the sum of the fx values by 3.

Question 14

Part (a) was answered quite well. Arithmetic errors were seen including when evaluating $15 - 9$ and $49 + 6$. Those who failed to score any marks often substituted in $x = 15$ and $y = 3$.

Part (b) was poorly answered with the most common response being that the actual value must be different.

Question 15

A very well answered question with many fully correct responses. Most worked out the concrete poured in tonnes and made the correct conclusion. Some worked out the concrete poured in kilograms but did not also show the conversion of 20 tonnes to kilograms and could only be awarded two marks.

Question 16

A very well answered question with many fully correct responses. Most students drew a box plot with the common error being to plot the lower quartile at 3 instead of at 4. A few plotted at both 3 and 4.

Question 17

Many students formed a correct equation, but errors were quite often made when attempting to solve. Most errors involved the fractions (even though a calculator was allowed) but the constant terms were also not always collected correctly. Some started with a ratio and made no further progress. Most who worked out x correctly were able to also get a correct ratio answer.

Question 18

When a correct diagram was used a fully correct response was usually seen. A small majority of students obtained full marks. Most of these used cos 52° but some did work out the side opposite to 52° and used Pythagoras theorem. Many of the students who drew an incorrect diagram were able to be awarded SC1.

Question 19

Part (a) was a challenging question for many with sign errors often being seen when expanding the second and third brackets. Errors were often made when multiplying the fractional terms. Some had the six correct terms but gave the final simplified answer as 42 instead of –42. Working with a single algebraic fraction for the second and third expansions often resulted in errors.

Part (b) was fully correct for just over a third of the students. More than a half did not score any marks. Those who 'solve' a quadratic equation and try to use the roots to work back to a factorisation were rarely successful.

Question 20

A challenging question for many students, possibly because it didn't appear to be on the topic of quadratic equations until the first step was completed. There were a significant number of non-attempts. Just over a quarter of the students scored 3 or more marks. About the same proportion scored 3 as scored 4. Common errors included incorrect expansion of either the pair of brackets or the single bracket. The question was the best discriminator from the later questions.

Question 21

Many different approaches were possible with the most commonly used method being to work out the total in the South and West stands. Some went on to link this to the proportion in those stands. Others worked out the total in the North and East stands which could then be added to the previous total.

A common error after working out 5760 was to then write $\frac{1}{4} \times 5760$ and $\frac{3}{10} \times 5760$

Setting up an equation was not seen often. Nearly all students made an attempt, and the question was well answered overall.

Question 22

Answered quite well which resulted in a similar performance to the iteration question on last year's paper. There were a significant number of non-attempts. Some obtained their answer from a calculator with no working being shown and could score up to full marks from this approach. Some did not understand the suffix notation and others substituted $x = 2$ (and $x = 3$ etc) into $5 - \frac{1}{x}$ after having substituted $x = 1$ at the outset.

Question 23

Well answered for the position of the question in the paper. Nearly a half of the students scored at least 3 marks. About the same proportion scored 3 as scored 4. A variety of valid indications for DEF being a straight line were seen. The most common incorrect indication was to state or show that **DE** + **EF** = **DF**.

Question 24

Part (a) was answered quite well with more than a half having a fully correct response. There were hardly any part marks.

Part (b) was challenging for many with $x = 12$ being substituted in at the outset instead of $x = 6$. Some used the value of k from part (a) as the value of A. Most students who worked out $y = 7$ also ticked the correct box.

Question 25

Some excellent responses but a challenging question for many students. Most correct working seen was from using scale factors. Some obtained 15.625 but did not cube root and scored two marks. Many started by dividing 1125 by $(3 + 4 + 5 + 12)$ and failed to score any marks. Only a few correct equations were seen. Some had the correct value of a (and/or b and/or c and/or d) without valid working and may have used trial. Some of those who gained the first three marks then only included two of d in their calculation of the total length of the edges.

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 feedback courses where you can review example responses from students and commentaries from our examiners.

Contact us

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

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