AQA
Realising potential

GCSE
Mathematics

8300/1H: Paper 1 (non-calculator) Higher

Report on the exam

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Contents

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Summary

Overall performance compared to last year

The mean mark fell by over 3 from last November. Further, there were many more questions this year with a non-attempt rate of over 10%.

Topics where students excelled

- Finding the midpoint between two points
- Working out a number using percentages
- Converting from standard form

Topics where students struggled

- Transformations
- Exact trig values
- Functions
- Geometric progressions
- Solving a quadratic inequality
- Vectors

Individual questions

Question 1

Just under half of the students answered this correctly. 5 was by far the most common incorrect answer, with 1 and 500 also seen fairly frequently.

Question 2

This question was not well done, with nearly three quarters of the students giving incorrect responses. Many different incorrect answers were given, with common ones being 30, 72, 120, 180, 240, 300 and 360.

Question 3

This question was well done. The most common incorrect answers were (0, –1) and (2, – 4).

Question 4

There were relatively few correct answers to this question. The majority of students either gave the answer 4 (from doing the calculations in the order given) or $4a$ (from $3a \div a = 3a$, $a + 3a = 4a$).

Question 5

There was a good spread of marks in this question. Many students achieved two marks by processing the given expression to 8^{-1} or $\frac{1}{8}$, but were unable to convert this to a decimal, with 0.8 being the most common incorrect answer.

Question 6

Over half of the students gave acceptable descriptions in **part (a).** However, many students simply repeated 'positive correlation' or said that downloads were more than CDs, which was insufficient for the mark.

In **part (b),** the vast majority of students used the graph, with the main error being a reading of 5200 instead of 5400. Errors were made in calculation, with some unfeasibly large amounts given as final answers.

Question 7

There were many correct answers to this question, with students tending to score three marks or zero. Those who went wrong almost always started by saying that 10% was 35, dividing 350 by 10 instead of 7.

Question 8

There was a good spread of marks in this question. Those students who worked algebraically often got to $4k = 3m$, but then lost the final mark by giving the answer as 4:3. Those who substituted a value for k had more success in finding the final answer, but many went wrong by also substituting a value for m.

Question 9

About one third of students understood that the solutions came from the x-intercepts. The y-intercept of 12 was a common incorrect answer, and despite the instruction to use the graph many students tried to find the solutions through algebraic methods, with the vast majority making little headway.

Question 10

Most students picked up at least one mark by using the formula for the area of a circle. However, there were many errors in squaring $\frac{\sqrt{17}}{2}$ and in working out what fraction of the circle 60° gave.

Most students who found both areas realised that they had to present them in comparable form, but about one fifth of such students did not.

Question 11

Over half of the students were successful on this question. Many of those who failed to score factorised only the first two terms.

Question 12

Part (a) was the best-answered question on the paper, with well over 80% of the students giving the correct answer.

Part (b) was not so well done, but over 60% of the students scored at least one mark. The students who went wrong usually struggled with the conversion of or calculation with 5×10^{-1}, which usually became 5, 50 or –5.

Question 13

Those students who understood the concept of an identity reached the correct answer with little fuss. The others, most of whom scored 1 mark for the correct expansion, tried to solve the 'equation', with varied and inevitably incorrect results, usually involving algebraic expressions, that had little pattern to them.

Question 14

This question was well answered, with half of the students scoring full marks. The most common incorrect method started with the division of 20 by 9, where, as usual, students seeing a ratio sign automatically thought that they had to add the ratios.

Question 15

In **part (a)**, fewer than half of the students understood that the fastest time came from lowest time, with 29.5 being a very common incorrect response.

Students struggled to score full marks in **part (b)**, with comments on consistency proving more difficult to make than on averages. Many students simply referred to the quartiles and median in both responses.

Question 16

Part (a) discriminated well, with a good spread of marks and most students scoring at least one. Of those who subtracted 15 and 8 from 80 to get 57, many then divided by 2 instead of 3. Those who did get to 19 often gave $\frac{19}{80}$ as their answer.

In part (b), as usual, conditional probability proved challenging. Only one quarter of the responses were correct, with the most common incorrect ones being $\frac{8}{80}$, $\frac{23}{80}$ and $\frac{8}{15}$.

Question 17

Fewer than half of the students scored any marks on this question, with students either making no attempt or showing no working and giving an apparently random number as their answer. Of those who got to $x < 27$, many gave that inequality or 27 as their answer.

Question 18

In **part (a)**, students showed little understanding of transformations. For the rotation, few realised that this could be done by either the reverse rotation of 90° anticlockwise or by completing a full rotation with 270° clockwise. A minority of students picked up the SC mark by locating Q, but only a small number could use this to compose the required vector, with answers in vector form few and far between. Centres should ensure that tracing paper is available for students, as those unable to access it are at a disadvantage in questions such as this.

The students found **part (b)** more accessible, with nearly half giving a correct answer, which was always (4, 4) and (7, 7). Those who went wrong usually ignored or didn't understand the information that BC was invariant, drew a right-angled triangle somewhere on the grid and reflected it.

Question 19

Most students showed some understanding of working with recurring decimals, with more dealing correctly with $0.\dot{4}$ than $0.0\dot{7}$. Some students correctly worked out $\frac{4}{9}$ and $\frac{7}{90}$ but then added them together as $\frac{11}{99}$.

Question 20

Only a minority of students converted to angles, with most working purely with the numerical values or algebraic variables. Those who did use 60° and 45° usually got to cos 90°, but often gave 90 or an incorrect value as the answer.

Question 21

Few students seemed to know how to work out an inverse or composite function and therefore only a small proportion of the marks were awarded in this question. Students often misunderstood the use of the index –1 in functions, and gave $f^{-1}(x)$ as $\frac{8}{x-9}$.

Question 22

Solving this problem hinged on understand that $9 + 3 = 5 + x$, where x leads to the size of d. Those students who realised that $x = 7$ usually found the correct answer.

Question 23

A small proportion of students were clearly proficient in simplifying and rationalising surds and quickly arrived at the correct answer. The majority, however, made little or no process, often simply removing root signs from numbers without rationalisation.

Question 24

Just under a quarter of students gave the correct answer. The most common incorrect answers were 2 and –2.

Question 25

Some students picked up a mark for saying that $r^2 = \frac{8}{9}$, but few made progress from there.

Question 26

In **part (a)** there was an easy mark here for converting the mixed number to a fraction, but many students did not try this method or gave an incorrect fraction, often $\frac{80}{16}$. Of those who correctly arrived at $\left(\frac{81}{16}\right)^{\frac{1}{4}}$, as many divided numerator and denominator by 4 as tried to find the fourth root.

In **part (b)**, a lot of students thought that 'as a power of 7' meant that 7 had to be part of the power, which inevitably led to no marks. A fair proportion of the students who understood the laws of indices missed out on the marks by omitting 'm' from their work and answer.

Question 27

While most students realised that the answer involved '4', very few gave it in the correct inequality, with $x < 4$, $x < \pm 4$ and $x = 4$ being the most common incorrect responses.

Question 28

Over one quarter of the students picked up at least one mark by finding an expression for XR or QR, but less than half of them could go any further. The best students gave concise and clear proofs, remembering to show that PS and QR are parallel.

Question 29

Over one third chose the correct statement in **part (a)**, with the first option being the most common incorrect choice.

Fewer were correct in **part (b)**, again with the first option being the most common incorrect choice.

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.

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Contact us

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

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