AQA

GCSE

Mathematics

8300/1H Paper 1 Higher

Report on the Examination

Specification 8300

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General
The majority of the paper was accessible to most students, although a few questions at the end of the paper had a high proportion of non-attempts. There was no evidence that this was due to a lack of time.

Topics that were done well included:

- solving an inequality
- relative frequency
- expectation
- solving a coordinate problem.

Topics which students found difficult included:

- surface area
- ratio
- completing the square
- simplifying surds
- the equation of a transformed curve.

Question 1
This question was answered correctly by just over half of the students. There was an even spread of incorrect answers.

Question 2

This question was very well answered. Of the incorrect options, very few students chose $\begin{pmatrix} -2 \\ 3 \end{pmatrix}$.

Question 3
Although the correct answer was also the most popular answer less than half of the students chose it. $12a^2$ was the most common incorrect choice.

Question 4
This question was answered correctly by the majority of students. Of the others, few selected 5000.

Question 5
This question was well answered, showing a much higher success rate than is usually the case for questions involving inequalities. Students were much more confident in working throughout with the inequality sign rather than changing to an equals sign and then changing back at the end.

Question 6
Approximately one third of students gave a fully correct solution. Many students wrote an initial fraction using the given decimals but then did not give their answer in its simplest form. Other students inverted the required fraction but then simplified that fraction correctly.

Question 7
The vast majority of students found the x and y 'steps' from *A* to *B* and repeated them to *C* and to *D* and were generally successful. Those who made errors were usually trying more complicated methods, often involving Pythagoras' Theorem.

Question 8
Both parts of this question were very well answered.

Question 9
Most students understood which calculation was required in this question, but errors in working with fractions restricted their success. It was common to see incorrect conversions of the mixed numbers to fractions, with $2\frac{7}{8}$ frequently changed to $\frac{9}{8}$. Changing the mixed numbers or fractions to having a common denominator was not done well, with, for example, $15\frac{1}{4}$ often incorrectly doubled to $30\frac{2}{8}$ to obtain a common denominator of 8. The question proved to be a good discriminator.

Question 10
This question was well answered, with a majority of students giving both correct values whilst most of the other students either gave either two incorrect values or made no attempt. A common error in working was to use direct proportion often starting with 4 = k6.

Question 11
A majority of students realised that the dimensions of the small rectangle were in the ratio 2 : 1 and went on to solve the problem. Students who chose dimensions that gave a perimeter of 15 cm for the small rectangle (eg 4 cm and 3.5 cm) using a trial and error method were generally unsuccessful in their attempts.

Question 12
The vast majority of students showed correctly converted numbers from standard form to ordinary form, but a sizeable minority then gave 8×10^{-4} as the smallest.

Question 13
Approximately half of the students chose the correct answer. Almost as many chose 150 mm^3, with few selecting the other two options.

Question 14
Part (a) was not well answered. Often, the method shown was to multiply the given ratio of 10 : 9 to get 20 : 18 etc, with no link made to the diagrams. Those who took a more systematic approach by listing the number of straight lines and arcs in the given diagrams and using this to predict further results usually either found the correct answer or made simple arithmetic errors. Students often found the calculations in part (b) challenging, often making arithmetic errors or failing to convert correctly between pounds and pence.

Question 15
This question was well answered, with any errors made usually being either in incorrect addition of decimals or selection of the wrong scores.

Question 16
This question was answered correctly by just over half of the students. 4 : 5 was the most popular incorrect answer.

Question 17
This question was very well answered with approximately three quarters of the students choosing the correct answer. There was a fairly even split between the incorrect options.

Question 18
The most successful students firstly identified that there were six faces to deal with. Common errors were to use the given radii as diameters and to use the circumference formula instead of the area formula. Some students worked out the volume of the tunnel rather than the surface area. Some students worked out 180 as the surface area of the two rectangular faces, but then used 180π when working out the total area.

Question 19
Just over half of the students were successful with part (a). A common error was to work out the range. A similar proportion of students were successful in part (b). Part (c) was not so well answered. Incorrect answers often referred to the median as the mean or only discussed the interquartile range or highest value.

Question 20
This question was well answered, with most students able to set up the correct simultaneous equations. There were many calculation errors made when eliminating one of the unknowns from the equations.

Question 21
Performance on this topic showed some improvement over previous series, although only a minority of students gave a fully correct answer. A common error was to maintain the orientation of the given triangle.

Question 22
This question was correctly answered by just under half of the students. Few chose B′, and there was a fairly even split between the other two options.

Question 23
While approximately half of the students made some progress on this question, often by choosing an original price and number sold and then working out the numbers for April, a relatively low proportion went on to work out the correct answer. These correct solutions often chose 100 as the starting number in each case. Those who tried to work with fractions to find the answer usually showed an incorrect method or incorrect calculations or both. The modal method and answer was $\frac{1}{5} \times \frac{1}{4} = \frac{1}{20}$, with $\frac{1}{5} - \frac{1}{4}$ being the next most common method leading to a variety of incorrect answers.

Question 24
Part (b) was answered much more successfully than part (a). In part 9(a) students struggled to convert $(2^9)^2$, often giving this as 2^{11} or 4^{18} or 4^{81}. In part (b), the modal incorrect method and answer was $25 \times 1.5 = 37.5$

Question 25
Approximately 20% of students were successful on each part of this question. There was no particular pattern to the incorrect answers.

Question 26
While relatively few students were fully correct with this question, a reasonable proportion did give a correct ratio between two of the variables. Many gave a to be $\frac{5c}{4}$ rather than $\frac{4c}{5}$ and others gave two thirds of $4c$ as $2.6c$.

Question 27
In part (a), while a small minority students were successful, many agreed with Jo, concentrating on the 'not factorising' rather than the 'cannot be worked out' part of the statement. For some students, their choice of 'Yes' or 'No' was contradicted by their reason. Those who did start correctly often omitted the ± required to get both solutions.

Question 28
This question discriminated well among the more able students. Many were able to convert $\sqrt{80}$ to $4\sqrt{5}$, but dealing with the other value proved much more challenging. Again, incorrect conversion of the mixed number to fraction form was common.

Question 29
Part (a) was very poorly answered, with little methodology seen. There was a much better response to part (b), although as in part (a) approximately 25% of the students made no attempt.

Question 30
Half of the students knew at least one of the values, with sin 30° being the most common. Many of these knew all three values, but then multiplied them all rather than multiplying and adding as required. Several students who obtained $\frac{3}{2} + \frac{1}{2}$ worked this out as $\frac{4}{4} = 1$

Use of statistics

Statistics used in this report may be taken from incomplete processing data. However, this data still gives a true account on how students have performed for each question.

Mark Ranges and Award of Grades

Grade boundaries and cumulative percentage grades are available on the Results Statistics page of the AQA Website.