AQA

GCSE

Mathematics

8300/2H Paper 2 Higher

Report on the Examination

Specification 8300

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General

Most students completed the paper in the time allowed with only a few questions towards the end of the paper having a significant number of non-attempts. Some of the topics that were new to this specification were not well answered. Presentation of work was often good but in some of the problem solving questions there were a significant number of poorly presented solutions. Some students were not able to recall relevant formulae that were needed to answer some questions.

Topics that were well done included:

- trigonometry in a right-angled triangle
- drawing a distance-time graph
- writing numbers, given in different formats, in descending order
- working out the median from a box plot
- working with a Venn diagram.

Topics which students found difficult included:

- conversion of square millimetres to square centimetres
- product rule for counting
- identifying the diameter of a circle using a circle theorem
- working out a formula from a graph
- interpreting a histogram
- working out an inverse function.

Question 1
This question was well answered.

Question 2
This question was not well answered. Most students chose 3.6 cm^2

Question 3
This question was quite well answered. The most common wrong answer was (6, 10).

Question 4
This question was quite well answered. The most common wrong answer was $n - 8$

Question 5

In part (a) there were quite a lot of correct answers but many gave the answer $\frac{4}{9}$.

Part (b) was poorly answered. Some students thought there were only nine single digit numbers and worked out 9 × 9 × 4. Others worked out 10 × 10 × 4 or 9 × 9 × 5. Another error was to assume that the middle two digits in the code did not change.

Question 6
In part (a) nearly all students worked out the correct y value when x was 2 but errors were common for the other two y values. Only some of those who had part (a) fully correct could then draw a correct parabolic curve in part (b). Some joined all the points with straight lines and others did not have the minimum value in the required range. Part (c) was quite often correct. Many included a y-coordinate as well.

Question 7
This question was well answered.

Question 8
This question was well answered with many students drawing the first two parts of the graph correctly. The third part quite often ended at (60, 40) or resulted in a line with a negative gradient. Most students used their graph to work out an answer to part (b) although many were not able to do so correctly.

Question 9
This question was quite well answered and was a good discriminator at the target grade. Many students set up an equation with $3x + 7$ on one side and this was often fully correct. A common error was to only use $3x + 5$ in an equation. Others confused numbers of CDs with probabilities and wrote equations such as $3x + 7 = \frac{19}{20}$
Some who set up a correct equation had a final answer of 27 instead of writing a probability.

Question 10
Most students worked out the angle for women as 250°. Weaker students made no further progress but most who were able to proceed did so correctly. Some misinterpreted the question and used 3360 as the number of women. Another common error was to divide 3360 by 70 instead of 140.

Question 11
A small number of students evaluated 9.56×3^{10} incorrectly, usually by working out 9.56×10^{10}
Many fully correct solutions were seen and almost all students had some valid working.

Question 12
This question was not well answered. Most students chose *BE*.

Question 13
This question was a good discriminator. Many students were able to complete this problem solving question successfully, usually by working out a combination of packs that satisfied the given conditions. A few made arithmetic errors working out the final total amount. Other students obtained an amount that was not the least but did satisfy the requirement to have exactly twice as many cheese slices as bread rolls. The most common error was to work with 105 bread rolls (7 packs) and 200 cheese slices (10 packs).

Question 14
This question was not well answered. Many students did not know how to start. Often letters other than n and C were used. When 2.5 and 0.6 were seen they were often used incorrectly within a formula or an expression.

Question 15
Part (a) was testing one of the new assessment objectives and some very good explanations were seen. Many other students did not identify the error made with a common incorrect response being that Sami should have square rooted 100 before dividing by 2. Others thought that the error was not having converted the final answer to a decimal.
Part (b) was also testing a new assessment objective and many students answered this part correctly.

Question 16
This question was well answered.

Question 17
Many students worked out the length of Q correctly. Most of those who gave fully correct responses subsequently set up a correct equation in x and y and gave their answer as 4 : 3. Others chose a value for x and reduced the resulting area by 10% and this method also quite often resulted in a correct final answer. A number of students assumed that when $4y = 3x$ the ratio $x : y$ was 3 : 4

Question 18
Both parts were well answered.

Question 19
Most students made a good start to this problem solving question by working out the number of each size of cake that Rana made. Only a small number went on to complete the rest of the question successfully. Many did not have a strategy for dealing with the profits made on each size of cake. A few persevered with a trial method and occasionally arrived at the correct answer.

Question 20
Fully correct responses were common when students identified the sine rule as the appropriate method and were able to recall the correct formula. Many others used right-angled triangle trigonometry or attempted the sine rule but applied it incorrectly.

Question 21
This question discriminated between students at the higher grades. Many students did not know that the solutions needed the application of the quadratic formula. Those who did, often could not remember the correct formula. Sign errors were made when rearranging the equation and there were substitution errors when the correct formula was used. A few students attempted a completing the square method but were rarely successful

Question 22
Fully correct responses were rare. Quite a lot of students obtained the value 5 with many of these subsequently working out the value of d after 7 seconds. A common error was to take d to be directly proportional to t while others used inverse proportionality.

Question 23
Fully correct responses were rare. Working out ***CD*** was quite often completed correctly but sign errors were common in attempts to work out ***BC***. Many could work out ***BD*** correctly using

BA + ***AD***. Some thought that showing that ***BC*** + ***CD*** = ***BD*** was a valid approach for deciding whether *BCD* was a straight line. This question had a significant number of non-attempts.

Question 24
Many students found this question to be one of the most challenging on the paper. Quite a lot of students could work out the frequencies but very few were able to use them to deduce the quartiles. Those who could correctly work out one of the quartiles usually found the lower quartile. Often 45, instead of 48, was divided by 4 when attempting to work out the lower quartile. Working was often difficult to follow.

Question 25
This question proved to be more accessible than the previous two questions and some very good attempts were made, with a significant number being fully correct. A common error was to use an incorrect cosine rule formula and these students could then not work out the correct radius for the sector. Correct working with 108° and 360° was often seen. Many did recall the formulae for the area of a circle and the area of a triangle. Some assumed that the two triangles were isosceles while others took them to be right-angled. A few worked out the arc length *BC* rather than the area of the sector *BCE*. Those who worked through with no errors usually showed an area with more than 2 significant figures at the end followed by 510 cm^2

Question 26
Both parts were quite well answered with many showing a good understanding of the new topic of invariant points.

Question 27
Neither part was well answered. There were many non-attempts. Those students who could work out the inverse function in part (a) usually then drew the correct graph. Part (b) was answered a little better with the composite function being worked out correctly more often than the inverse function had been. Some graphs were not the correct shape even though they went through the correct points at x = 0°, 90°, 180°, 270° and 360°.

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.