AQA

GCSE

Mathematics

8300 3H Paper 3 Higher

Report on the Examination

Specification 8300

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General

Most students completed the paper in the time allowed, although many of the later questions were not well answered by this small entry, with a high number of non-attempts on some of the more challenging questions. The quality of presentation of work varied quite significantly.

Topics that were well done included:

- interpreting a number line using inequalities
- interpreting the effect of an incorrect assumption.

Topics which students found difficult included:

- alternate segment theorem
- ratio problem
- rate of change from a graph
- algebraic reasoning
- obtaining integer solutions from a quadratic graph
- composite functions.

Question 1

This question was well answered. The most common incorrect answer was $-4 \leqslant x < 5$.

Question 2

This question was quite well answered. The most common incorrect answer was 1 : 100.

Question 3

This question was quite well answered. The most common incorrect answer was $n + 2$.

Question 4

This question was not well answered. The most common answer was $x + y = 0$ with slightly more responses than the correct answer of $y = -5$.

Question 5

This question was challenging for many students. Common incorrect responses were $x^2 - 64$ and $x^2 + 64$. A significant number of students expanded correctly to four terms and then simplified incorrectly.

Question 6

This question was not well answered with a significant number of non-attempts. The most comment errors were to use cube numbers instead of powers of three or to break down 268 using a factor tree to give an answer of $2 \times 2 \times 67$.

Question 7

This question was well answered. The most common incorrect answer was $5 < t \leqslant 10$ with very few students choosing either of the other two incorrect answers.

Question 8
This question was quite a good discriminator but very few fully correct solutions were given. Many students correctly worked out the other angles in the isosceles triangle and made no further progress. Other students only worked out the obtuse angle at *P*.

Question 9
Part (a) of this question was well answered by almost half of the entry. Students who made the correct first step usually went on to give a fully correct answer. The most common errors were to give a first step of $v + u = at$ or to give an answer of $v - u \div a = t$. Part (b) was a good discriminator with many correct responses for the consistent units for speed and fewer correct responses for the units for acceleration. Many students gave miles per hour or mph as the consistent units for speed.

Question 10
This question had a significant number of non-attempts and was not well answered with a majority of students showing no evidence of construction arcs.

Question 11
Part (a) of this question was a good discriminator. Common errors were incorrectly splitting 36 with no voucher into 24 men and 12 women, writing frequencies as fractions and making a significant number of arithmetic errors. Part (b) was not well answered. The common error was to add 15% to £27.20 leading to an answer of £31.28. Very few students used incorrect money notation.

Question 12
Part (a) of this question was a good discriminator. Most students correctly divided 140 by 50 to obtain 2.8 hours. Significant numbers of students then converted this to hours and minutes incorrectly with 2 hours 8 minutes or 2 hours 80 minutes leading to 3 hours 20 minutes being quite common. Students who gave the correct conversion usually went on to give the correct arrival time. In part (b), which was generally well answered, the common error was to refer to the journey time rather than the arrival time stating, for example, that the journey was longer.

Question 13
This question was also a good discriminator. The common error was to plot the median at 3 hours together with the upper quartile at 4 hours. A lack of accuracy when plotting at 0.5 was quite often seen.

Question 14
Part (a) of this question was generally not well answered. Many students omitted $x + 2$ when setting up their initial equation. Of those who obtained $x = 6$, a small majority went on to give the correct probability. The common error was to omit the 5 from their answer, giving $\frac{12}{31}$ as their final answer. Part (b) was not well answered. Common errors were to give answers of $\frac{5}{31}$ or $\frac{11}{31}$.

Question 15
This question was not well answered. The most common answer was $24x^4y^3$ with more responses than the correct answer of $2xy$.

Question 16
This question was not well answered. The most popular answers were 18, followed by –18. Only a small minority of students gave the correct answer.

Question 17
This question was generally not well answered. There was a wide-spread misunderstanding with 13 – 5 = 8 being a rare first step. Many students added up the parts of the ratio and calculated 4152 ÷ 25 to give 166, often followed by 166 × 5 = 830. 4152 ÷ 13 = 319 followed by 319 × 5 was also a common error.

Question 18
There were few fully correct solutions to this question although most students made some progress with the expansions. The most common error was in dealing with the minus signs in the last term, although a significant number gave the first term of one or both expansions as $6x^2$. Most students were able to correctly simplify their six terms.

Question 19
The question was not well answered. Many students assumed the lines *AB* and *DC* were parallel and answered 60° and alternate angles. Most of the students who gave the correct answer of 65° did not give the correct reason.

Question 20
This question was not well answered. The most common answer was to give the second box with significantly more responses than the correct answer of the third box.

Question 21
This question was not well answered with very few correct solutions. There were many non-attempts. Common incorrect answers included components of $3 \times 4 \times 6^4 \times y^5$.

Question 22
This question was not well answered with a majority of students not recognising this was assessing knowledge of the cosine rule. Students who did use cosine rule usually gave a fully correct solution.

Question 23
This question was not well answered and there were many non-attempts. Many students referred to the scales being incomplete or to shading or lack of shading.

Question 24
This question was not well answered and again there were many non-attempts. Some students gave b in terms of c but made no further progress. Many students in attempting to rewrite the ratio gave $a = \frac{4}{9}b$.

Question 25
This question was not well answered. Very few students knew that a tangent was required and there were many incorrect answers of 15 cm/s.

Question 26
This was one of the least attempted questions on the paper with only a very small number of students making any progress and no correct solutions. Most attempts involved substitution or some form of trial and error.

Question 27
This question was not well answered, although a significant number of students recognised that Pythagoras' theorem was required and made some progress. Of those students approximately half of them went on to correctly work out the volume.

Question 28
This question was challenging for all but the most able students with very few progressing beyond substituting at least one pair of values into the equation. There were many non-attempts. Many students did not know $q^0 = 1$.

Question 29
This was another of the least attempted questions on the paper with only a small number of students identifying the integers with some of those who did omitting the solution of 2.

Question 30
This was the least attempted question on the paper and was a topic that appeared unfamiliar to many students. Some students correctly gave fg(x) in unsimplified form but made errors when attempting to give it in the required form. $2x^2 + 7$ was a common incorrect answer, whilst another common error was to attempt to multiply out $(\frac{x}{3} + 4)(6x^2 + 3)$.

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.