AQA

GCSE

Mathematics

8300/1H Paper 1 Higher
Report on the Examination

8300
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General

As the majority of the students were re-sitting, many found the second half of the paper difficult. However, the mean mark was higher than the previous two November series.

Topics that were done well included:

- laws of indices
- Fibonacci-type sequences
- estimating the value of a square root
- finding the midpoint of a line

Topics which students found difficult included:

- probability from a Venn diagram
- set notation
- calculating with recurring decimals
- surds
- conditional probability
- turning points
- trigonometric values

Question 1

This question was well answered with 250 × 0.15 the most frequent incorrect answer.

Question 2

This question proved difficult, with $\frac{2}{3}$ being the most popular answer and $\frac{3}{2}$ receiving the same number of responses as the correct answer.

Question 3

More than half of all students answered this question correctly. (8, 12) was the next most popular option.

Question 4

This question was well answered with the incorrect responses spread fairly evenly between $2x^4$ and $8x^4$

Question 5

Neither part was well answered. In part (a), many of the incorrect responses said that the equation of the line of reflection was actually $x = 1$ or $x = 3$, while others discussed the distance between the

two triangles. In part (b), many students said that the transformation was not a rotation, often saying that it was actually a reflection. Students still struggle with phrasing their responses to questions such as this correctly, even when they may understand the error, and should perhaps have more practice of this.

Question 6

In part (a), the modal answer was 28, which would have been the answer had it been a linear sequence. Other popular incorrect answers were 16^2 (often calculated incorrectly) and 20 (Fibonacci-type sequence). In part (b), over half of the students gained both marks and most of the others gained one. Those who went wrong usually struggled with adding negative numbers.

Question 7

Most students scored at least one mark by multiplying 4 and 60, but over half of these included at least one letter in their answer.

Question 8

Over half of the students dealt successfully with at least one of terms. Perhaps surprisingly, more did this with $\left(3^2\right)^7$ than with 27.

Question 9

The vast majority of students scored at least one mark, correctly substituting values into the given formula, but less than a quarter gained all four marks. Many tried to calculate using 3.14 – this will not usually be expected in the non-calculator paper, and never in a question as complex as this one.

Question 10

This question discriminated well, with the majority of students scoring at least one mark. Those who failed to score full marks often added unrelated numbers or simply compared the ratio 80 : 29 to 4 : 3

Question 11

In part (a), many students started by trying to convert the given numbers and usually made errors. Over half of the students scored a mark for 10^5, but the majority of these made an error when calculating 2 ÷ 8 (with 4 and 6 being common results) and others converted 0.25×10^5 to 2.5×10^6.

There was a better response to part (b), although some students lost a mark by giving their answers as 10^3 and 10^{-2}.

Question 12

This question was not well answered, with less than one third of the students scoring the mark. There was no apparent pattern to the incorrect answers.

Question 13

Over 40% of the students scored at least two marks by getting one of the values correct. Those who scored no marks usually tried to manipulate the algebra rather than substitute the required values.

Question 14

This question was well answered, and was actually the best-answered question on the paper.

Question 15

Virtually all of the students scored at least one mark, with the fourth statement being the one that most were correct with.

Question 16

Approximately half of the students scored two or more marks, showing a correct method to work out $\frac{5}{3}$ of 45 and then subtracting 12. Most then got stuck on how to proceed.

Question 17

The third option was not popular, but the rest of the responses were spread fairly evenly among the other three.

Question 18

Most students scored a mark for expanding the brackets, but many struggled with the fraction. A very common mistake was when multiplying both sides by 3, correctly giving $6x + 60$ on the right-hand side but giving the left-hand side as $3x + 45$. It was also common to see students start by 'subtracting' 10 from each side, getting $\frac{x+5}{3} = 2x$.

Question 19

Both parts were poorly answered, with only about one quarter of students being successful in each case. In part (a), more than half of the students chose team B, usually citing the higher maximum value or higher quartiles. In part (b), all sorts of incorrect justifications were given. It should be stressed to students that when asked for a statistical justification it will usually require only one

measure to be mentioned, and that those students who also give other measures will not get the mark.

Question 20

None of the probability questions on this paper were well answered. Here, in part (a) most students realised that 8 was a relevant number, but either simply gave that as the answer or gave an incorrect denominator, usually 36. Few students were correct in part (b), with 4 acting as 8 did in part (a). Very few students scored both marks in part (c), although some did pick up a mark for evaluating either 28 or 25.

Question 21

Less than one quarter of the students gave the correct answer here, with options 1 and 2 both being more popular. Few students actually set out the subtraction in the blank space, and those who did were the more successful.

Question 22

This question was not answered well, with most students scoring zero. The successful students realised that working out the gradient of line *M* was the starting point, but most ignored that line and tried to work out the gradient and intercept of line *L* purely from the given point on that line. This was the first question on the paper with a large percentage of non-attempts.

Question 23

Part (a) was done only slightly better than part (b), so students who understood this type of factorisation were often successful in both parts. In part (a), $x(5x + 6) – 8$ was a popular answer, while in part (b) many students 'cancelled' terms, for example, cancelling the x^2 terms and then subtracting 4 to give $9x + 10$.

Question 24

This question was not well answered. Most students took $\sqrt{18}$ to be 9 and/or $\sqrt{50}$ to be 25, or gave them approximate values such as 4.5 and 7.1 respectively.

Question 25

Both parts of this question were poorly answered. In part (a), the modal answer was $\frac{1}{6}$, presumably because if two red balls were taken there would be 1 red ball and 5 blue balls left. Few students understoof how to work with conditional probability in part (b), and of those who had some idea several bizarrely reduced the denominator from 8 to 6 for the second choice rather than from 8 to 7.

Question 26

Over one quarter of the students did not attempt this question, but a significant number picked up at least one mark for using the correct formula for the circumference of a circle being one side of the equation. Only a few students scored full marks, but those who did showed excellent algebraic work.

Question 27

Neither part was well answered, but nearly twice as many students were successful in part (a) than part (b). Many students did not attempt this question at all, with over half giving no answer or working in part (b).

Question 28

There was more success with this question, but many students gave the answer as 50 or –50.

Question 29

Approximately one quarter of the students picked up a mark for knowing at least one of the trigonometric values, but few went on to score more marks. Several of those who knew all three values omitted the 8 on substitution.

Mark Ranges and Award of Grades

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