Pearson Edexcel

Examiners' Report
Principal Examiner Feedback

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International GCSE Mathematics
4MA1 2FR Principal Examiner's Report

This was an unusual examination series, with a very small entry. A large proportion of responses were of a high standard, but there was significant variation in quality, with others leaving many leaving many questions blank.

On the whole, working was shown, but it is still the case that many students would do well to show us all the stages in their work, especially when a calculator is used.

Problem solving questions often cause students problems and the best advice for them is to try to do what you can even if you cannot finish the question as valuable method marks can often be gained.

Question 1
(1a) This question was answered correctly by the vast majority of candidates, identifying the largest number in the table and selecting Tonga as their answer.
(1b) For such an early question on the paper, this was not answered very well, with candidates often giving the answer of 'five' or '5', ignoring the place value of the digit.
(1c) Most candidates were successful in writing the number in words, with a small minority not gaining the mark due to including numbers, such as 'and 37' in their answer.
(1d) Answered well by most candidates, the common error was to state 8594, simply because it started with the same first two digits, rather than working out which number was actually closer to 8500.
(1e) The majority of candidates selected the correct operation in adding 2864 to 8047 to obtain a correct answer.

Question 2
Naming mathematical shapes is often problematic for foundation tier candidates, with many incorrect responses seen writing circle or ball. Counting edges in part (b) was not well answered, with candidate often missing or miscounting the hidden edges (shown dashed). However, counting faces in part (c) was much more successful for many candidates.

Question 3
This question was generally answered very well, with most candidates scoring on all three parts of the question. As the sequence was not linear, some candidates attempting to find the nth term struggled to score marks. The best responses used clear English in part (b) and showed a calculation in part (c) before stating their answer.

Question 4
All parts of this question were answered well, with candidates having no trouble identifying the scale being used, and both reading off values and drawing bars with great success. In part (c), the most common errors were drawing the bar to a height of 5.3 or 4.4.

Question 5
(5a) Measuring the length of BC was answered well by those candidates who clearly used a ruler. Unfortunately a significant number of candidates assumed that the squares

were 1cm each, and some even went on to use Pythagoras' Theorem to calculate the length of the line in squares, rather than in cm.
(5b) It was clearly that many candidates did not know the mathematical name of 2D shapes, with 'rectangle' commonly seen as an incorrect answer.
(5c) This part was one of the most poorly attempted questions on the first half of the paper, with the majority of candidates not able to recognise a rotational symmetry of order 2.
(5d) Most candidates were able to clearly mark an obtuse angle, however some candidates marked one correct and one incorrect and hence were not awarded the mark.
(5e) Working out the area of the trapezium was well within the reach of many candidates, especially given the formula on the formula page. It was pleasing to see many candidates writing the calculation before the final answer, to ensure that the first mark was definitely gained, even if an error was made subsequently.

Question 6
This question was answered with a variety of different approaches, many of which were successful. The most common approach was to work with decimals to obtain 3.90625 and calculate the remainder from $0.90625 \times 32 = 29$. Virtually all candidates obtained at least the first mark, working out that there were 125 balloons in total.

Question 7
Whilst many candidates were able to complete the first stage of the calculation, using the angle sum of a triangle to work out an expression or value for angle *BDC*, it was extremely rare for candidates to provide correct reasons for their calculations. Even the better attempts at this question struggled to provide complete angle reasons, instead gaining just one of these marks for partial reasoning.

Question 8
Candidates generally did well on part (a) although some candidates incorrectly calculated $5\times(9+20)$. Those who used inverse operations were usually successful on (b), although some tried to use repeated addition which was less successful as this introduced a greater likelihood of introducing errors. Part (c) was answered well by many candidates, although a few omitted T= or made *n* the subject of the formula.

Question 9
Most parts of this question were answered well, although a significant number did not correctly interpret 'cube root' and hence failed to gain the mark on (b). In part (d) candidates were generally able to gain at least the method mark by correctly converting to decimals, percentages or fractions with a common denominator. Many of these went on to score both marks with a fully correct answer. Part (e) was answered well by the vast majority of candidates, showing both the initial fraction of $\frac{36}{96}$ and correct simplification, either in one step, or in stages by dividing by 2 and 2 and 3.

Question 10
A common approach to this question was to work out the length of time it takes (27.2 minutes) and compare this to half an hour. Most candidates obtained suitable comparisons in seconds, minutes or hours. Many alternative approaches were seen, including the number of laps per half hour, or the duration each lap would take if the

race took exactly half an hour to complete. Some candidates failed to recognise that "give a reason" meant that a mathematical calculation is required.

Question 11
This was accessible to most candidates, with the majority taking the shorter approach of using 24 as the denominator. Concerningly, some candidates simply added the numerators and denominators.

Question 12
Both parts of this question were answered well, with correct algebra seen in the vast majority of cases.

Question 13
Finding the mirror line caused no difficulty for most candidates, even though it was not on a grid line. The rotation in (b) was not answered as well, with a fair number of candidates rotating clockwise instead of anticlockwise, and a few extremely poor responses showing reflection or translation.

Question 14
Candidates were generally successful in completing the two way table, and most were able to identify the correct probability. It was quite common to see candidates mis-interpreting "4 or less" as "less than 4" restricted them to a maximum of one mark for a correct denominator. Candidates did not seem familiar with the calculation required to find an estimated frequency from a probability, with many leaving this question blank.

Question 15
The most successful approaches to this question incorporated a tree or table method. Unfortunately a significant number of candidates stopped at this stage and failed to write the product of powers of prime factors. Some candidates did not show any working out, relying on their calculator to provide an answer which gained zero marks as they did not show at least two correct stages of working.

Question 16
Many correct answers to part (a) although candidates struggled with converting to standard form in part (b). Calculations using standard form in part (c) were answered well in most cases, infrequently with errors caused by adding 5.6 to 2.3 initially and then attempting to combine the indices.

Question 17
This question was polarising for candidates, either fully correct or left completely blank. Some responses did manage to pick up mark by partially completing the number cards showing the median in the correct location.

Question 18
This question was challenging for foundation candidates. Some did manage to get a correct lower bound of 33.75, but very few managed to obtain the correct upper bound of 33.85. Candidates frequently gave incorrect values of 33.84 or 33.9 which demonstrate a poor understanding of this topic.

Question 19
Many candidates missed the instruction to use suitable approximations, and wasted a lot of time attempting to work out an accurate answer using written methods. Even when rounding values, candidates often chose to round to 2 significant figures, which does not lend itself to mental calculation and hence did not earn method mark. The best responses came from candidates who rounded each value to 1 significant figure, worked out this as 140 000 and gave a correct conclusion.

Question 20
With the absence of a clear instruction to use Pythagoras, weaker candidates struggled to make a start on this question. Those who recognised this was the correct approach usually gained at least the first two marks. There were very few fully correct responses due to the lack of appropriate rounding. Candidates who got to this stage in the question often rounded down, not realising that purchasing the steel in lengths of whole metres required them to round up to 19 m.

Question 21
This question was answered well by a large number of candidates, obtaining a correct answer from a fully correct method. Weaker candidates often simply averaged the two means, which was a commonly seen incorrect answer.

Question 22
Correct factorisations were obtained by a good number of candidates, although many did score zero marks due to leaving this question blank. Part (b) was generally answered better than (a) with over half of the cohort gaining full marks. Common errors were responses incorporating sign errors, or not dealing with the inequality correctly if they took an approach which required dividing by a negative number.

Question 23
Good knowledge of indices was demonstrated by many candidates in part (a) by obtaining the correct value of x. Part (b) was also answered well in many cases, with candidates demonstrating accurate application of index laws. Some candidates failed to subtract indices correctly, giving 3^{-14} or divided the indices to obtain $3^{\frac{4}{3}}$ which gained zero marks.

Question 24
This question was one of the most poorly answered questions on the paper. Even though two marks could be awarded for drawing the appropriate straight lines, many struggled with drawing $y = x$, instead opting to draw a diagonal line from the origin to the top right corner of the grid provided. Candidates that did manage to drawn three correct lines often gained full marks as they were able to identify the correct internal region **R**.

Question 25
Responses to this question generally showed some correct algebra for a first step of working, rearranging the equation to $2y = 7 - 5x$, however only the most able candidates were able to complete the rearrangement to $y =$ and obtain the correct gradient of $-\frac{5}{2}$.

Question 26
This question was polarising for candidates and split the cohort into two almost equal groups. One half gained full marks, demonstrating a good understanding of trigonometry, applying it correctly to solve the problem posed. The other half struggled to make any progress at all, with no correct trigonometric stage of working. Candidates should be discouraged from using the sine rule (which is not even on

Summary
Based on their performance in this paper, students should:

- Learn how to approximate calculations by first rounding each value to one significant figure.
- Learn the mathematical names of 2D and 3D shapes
- Provide written reasons for angle methods when asked for 'give a reason for each stage of your working'.
- Develop understanding of transformations, both applying and identifying transformations.
- Show written working for calculations, rather than just the answer.
- Develop understanding of upper and lower bounds

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