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Examiners' Report
Principal Examiner Feedback

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IGCSE Mathematics 4MA1 2FR Principal Examiners Report

Students who were well prepared for this paper were able to make a good attempt at all questions. It was encouraging to see some good attempts at topics new to this specification. Of these new questions, students were particularly successful in the question assessing the n^{th} term.

On the whole, working was shown and easy to follow through. There were some instances where students failed to read the question properly. For example, in question 2 some students gave the answer as 15.5 not realising the question is asking for the greatest number of decorations.

Using angle theorems seemed to be a weakness as does factorising algebraic expressions. On the whole, problem solving questions and questions assessing mathematical reasoning were not tackled well in particular question 23.

Question 1

Part (a) was not answered well. Some students wrote their list starting from the number with the least digits to the number with the most digits.

Part (b) was answered well. A common error was to write 0.7

Part (c) was answered well. Some students wrote $\frac{0.47}{1}$

Part (d) was answered well.

Question 2

Students generally answered this question well. Many students did a correct conversion and obtained 15.5 but never wrote down the greatest number of decorations. It was surprising to see some students writing $700 \div 0.45$

Question 3

Part (a) was answered well.

Part (b) was not answered well. Many students don't know how to convert from improper fractions to mixed numbers.

Part (c) was answered well.

Part (d) was not answered well. A common error was to say that $\frac{1}{6}$ is halfway between $\frac{1}{4}$ and $\frac{1}{8}$ because 6 is halfway between 4 and 8.

Question 4

Students generally did well on this pictogram question. In part (a) nearly all responses were correct. Again, in (b) very few responses were incorrect – only those that had misread the question. In (c) the majority of students gave the correct response by drawing two and half circles.

Question 5

The first two parts of this question were well done with students able to write the numbers in order of size and find the difference between the midnight temperature. Some students wrote the answer as -15 .

Parts (c) proved more demanding with 7 being common incorrect answers. Part (d) was demanding as well. A common error was to add 10 to -4

Question 6

Most students were able to correctly work out all of the missing values in the two-way table in part (a). Checking their final answers by adding across or down the table in a different way could have enabled those who did make an error to correct their work.

Part (b) was completed less well, some students identified the numerator as 6 and the denominator as 43 or 80. Part (b) was surprisingly answered well. Many students gained 1 mark by having a correct numerator or a correct denominator provided their answer was a probability.

Question 7

Part (a) was answered well. Many students obtained the correct answer.

Part (b) was not answered well as many students could not recall inverse operations to addition and division.

Question 8

This question on time was very poorly done, given that time has an everyday application. The problem was one of the times was given in the 24-hour format. Students need to be encouraged to consider whether their answers are reasonable – answers such as 6 hours or less were seen when the time up to midnight is more than 6 hours.

Question 9

There were many correct solutions to this question with all 3 marks gained by the students. The most common error, made by a significant number of students, was to include the price of only one coffee and one tea instead of two of each given in the list of items. Some students simply added the given prices, with no attempt to calculate the change by subtracting from 20. Some students forgot to include the change in the calculation.

Question 10

The majority of candidates gained both marks for this construction giving the triangle with sides' length within a $\pm 2\text{mm}$ tolerance and the angle within a $\pm 2^\circ$ tolerance. Students need to understand that accuracy is essential and take the time to measure very carefully or risk losing marks unnecessarily.

Question 11

In part (a), many students could not factorise the expression. A common error was to write the final answer as $x(3x - 0)$

Part (b) was answered well by many students.

Many students in part (c) gained at least one mark. Many students could work out 24 but had difficulty working out -15 . A common incorrect answer was 39

In part (d), many students knew they had to substitute -4 for t and they showed a correct method. Many students lost marks because when they squared -4 they got -16 . This led them not to gain full marks. Many candidates gained 1 mark by correctly obtaining -28

Question 12

Many students found this question difficult. Common errors stemmed from working out dimensions of the floor incorrectly. Many students correctly worked out 5×8 or 9×3 or 9×8 but then incorrectly worked out the other area of the rectangle. Students could be encouraged to show the methods used to find missing lengths and show calculated lengths on the diagram. In this way marks for a correct method can be awarded even if the final answer is incorrect. Some students worked out the perimeter of the shape instead of the area.

Question 13

Part (a) was answered poorly. Many students did not know how to solve equations.

Part (b) was answered poorly. Many students could not make w the subject of the formula. A common incorrect answer was $w = 7t + 3$

Many students gained at least 1 mark in part (c). They had difficulty in writing the final answer as a formula.

Question 14

Many students gained 2 marks but could not provide any reasons. A minority of students gained full marks. Many students could not give the correct reason as to why angle EBC is 75° . Students are encouraged to learn their reasons for working out angles and the correct mathematical terminology in describing angles.

Question 15

Part (a) was answered well as many students could write down the modal class interval correctly.

In part (b), many students answered this question quite poorly. A common error by some students was to use the lower limits or the upper limits to work out $\sum fx$. This method is incorrect and the students need to understand that they must use the mid points. Other common errors were $\frac{1080}{5}$. Some students worked out the cumulative frequencies and multiplied them by their midpoints.

Question 16

Many students found this question difficult. Many students could not recall the formula for the volume of a triangular prism. Some students worked out the volume of a cylinder but did not divide it by two. A common incorrect answer for the volume of the triangular prism was 180 cm^3 . Students are encouraged to learn and recall correct formulae for 3-D shapes.

Question 17

Part (a) was answered well by students. Most students were able to gain the M mark by recognising that the sequence increased by adding 6 each time and hence writing $6n$, but there was a significant number writing $4n + 6$ or even $n + 4$. Students need to be encouraged to check their rule to see if it works for the next term in the sequence

Part (b) was a very challenging question to many students as the majority did not know how to work out a common number in the two sequences.

Question 18

This was a standard percentage increase question that allowed a lot of students to gain some marks. Some students were let down by a lack of method shown. Weaker students struggled to find 7%, and even those who knew how, didn't normally show the steps of their method and made calculation errors. Many who were able to find 7%, forgot to add this onto the original amount or erroneously subtracted their 7% from the original amount.

Question 19

Parts (a), (b), (c) and (d) were not answered well. Commonly seen errors in part (a) arose from finding the members of A only by giving an incorrect answer of 2, 4 and 6. Many candidates could not interpret the intersection in part (b) and therefore gave a variety of incorrect answers. Part (c) was poorly done due to a lack of understanding of Venn diagrams. A common incorrect answer for part (d) was $\frac{3}{12}$ thus gaining one mark.

However, from the number of non-responses, it is clearly not a well-known topic.

Question 20

Students are unfamiliar with the terminology of lower and upper bounds tended to state numeric values with no connected logic to the question. Common wrong answers were 13 and 12 in part (a) and 11.3 in part (b).

However, from the number of non-responses, it is clearly not a well-known topic.

Question 21

Many students did not know how to work out compound interest. Dealing with 1.5% caused some students issues and they were seen using the multiplier 1.15 rather than 1.015. Some students failed to distinguish between compound and simple interest and calculated $4 \times 90 = 360$ thus gaining 1 mark. It was disappointing to see students answering this question poorly.

Question 22

This question was answered poorly. Many students did not identify a right angle thus not understanding that trigonometry needs to be applied in this question. A common method was to use Pythagoras theorem to find a length using 15 and 37.

Question 23

This question was answered poorly. A common mistake by many students was to assume that the sum of the angles in a pentagon is 360° . Many students has no understanding of polygons and their properties.

Question 24

A minority of students at this level were able to gain full marks on this question. Most students could not set up the expression $1 + 0.65 + 1.22$ or $100 + 65 + 122$. A common error was to write $1 + 0.65 + 0.22$ or $100 + 65 + 22$ leading to incorrect answers. The most difficult part of the question was writing a 22% increase as 1.22 or 122. This was another topic where students lacked understanding.

Question 25

In part (a) a common error was to omit 4 from their factorised answer. Many students found this question very difficult. A common incorrect answer given by students was $de(12d + 16de)$.

Part (b) was done quite well by some students. Many students gained 1 mark as they could simplify $\frac{15}{5}$ and one of $\frac{k^4}{4}$ or $\frac{m^3}{m^2}$ correctly.

Summary

Based on their performance in this paper, students should:

- be able to convert cm to m or vice versa
- Learn how to use a 24-hour format for time
- learn, recall and apply the formula for compound shapes
- be able to attribute angles correctly when writing them down and show clear working.
- read the question carefully and review their answer to ensure that the question set is the one that has been answered
- make sure that their working is to a sufficient degree of accuracy that does not affect the required accuracy of the answer.

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