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Examiners' Report/
Principal Examiner Feedback

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Mathematics A (4MA0)

Paper 1FR

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Principal Examiner's Report
4MA0-1FR

Introduction to paper 1FR

Overall the paper was well answered at the beginning with students finding the more challenging questions at the end of the paper difficult to gain marks on. Students tended to do particularly well on the algebraic questions but found those on shape and space more challenging. The majority of students showed adequate working, but there were still some who lost marks by failing to do so. It was common for students to get confused with Mathematical terminology such as "area" and "perimeter or names of shapes, and more practice on the language of Mathematics would be beneficial.

Report on Individual Questions

Question 1

This question was well answered by the majority of students. A common error seen was to write 'fourteen thousand and twenty six' as 1426.

Question 2

Most students were able to score well on this question. Those that did not gain full marks usually found it hard to convert 70% to a fraction in simplest form.

Question 3

Some students were unable to name the pentagon, with hexagon being the most frequent incorrect answer. Some students also struggled to give the correct order of rotational symmetry. In part (b), students were generally able to give the letter of the shape with one line of symmetry, but were unable to name both shapes for part (ii) of the question.

Question 4

Most students correctly showed knowledge of even numbers, multiples and factors. Writing all the factors of 40 was quite a challenge for most, with the factors 1 and 40 being frequently missed. For part (d) students often answered that 27 and 33 were prime numbers.

Question 5

Most students were able to find the next two terms of the sequence and describe how they found these terms. Most students, when finding the 12th term for (c) just continued the sequence and correctly got the term. It was pleasing to see so many correct responses for the explanation needed in part (d), with students often continuing the sequence and realising that 69 and 73 were in the sequence, so 70 could not be. Arguably the more efficient answer was to recognise that the sequence contained only odd numbers (or numbers ending in 1,3,5,7,9 as many students put it) and that 70 is even.

Question 6

A well answered question for most students. For part (c), a few gave the area rather than the perimeter.

Question 7

Many students were able to gain high marks for this question but those that did not often got confused with the terms mode, range and mean, sometimes finding the median rather than the mean.

Question 8
This question was fairly well answered by many students but common errors were to simplify the terms in part (b) correctly and then to put a minus sign between them, presumably as the final term was negative 2*f*, giving 7*e* – 4*f* instead of 7*e* + 4*f* and also to factorise with a non-integer value in the bracket, commonly 6(*w* + 2.5) for part (c) rather than 3(2*w* + 5). Expanding and simplifying the quadratic in part (d) was very well completed with few errors.

Question 9
The most common mark gained here was one for a correct method to find the angle of 62°, but after that many students were unable to progress correctly. Some thought that angle *x* was 62° and some thought that *PQR* and *QPR* were equal to one another.

Question 10
The majority of students were able to write down a correct ratio in simplest form for part (a) but many stumbled in part (b) and were unable to share the ratio, with some multiplying 64 by 7/9 rather than dividing by the total. Some who showed good working were unable to select the correct answer and students should be coached in ensuring they are answering the question and not giving the wrong share or both shares when they are required just to give one.

Question 11
This probability question was answered well by most students, part (c) being the only part causing problems for a minority of students who often did not really understand what the question was requiring.

Question 12
This question involved students realising that the formula for the area of a triangle is 0.5 × base × height and most thought it was just base × height, so they gained no marks. Those that got the formula correct generally went on to gain full marks. Students need frequent reminding of the formula for the area of a triangle.

Question 13
A good number of students gained full marks here. Common errors were to think that, for example, 4*g* means 4 + g and that −20 − 24 comes to +44. In part (b), many students were able to gain a method mark for a correct initial substitution in the formula even though they could not progress any further. Students should be taught that in a question like this, which may appear challenging, it is worth substituting the values into the formula as a method mark can generally be gained for doing so.

Question 14
Many students were able to give the correct answer of 29. Ten was a common incorrect value where the student had just added up the numbers in the 'number of goals' column. A minority of students progressed to finding the mean as this is often what is required from a table that looks like the one in this paper, but they still gained a method mark. Some also miscalculated 0 × 5 = 5, but they received a method mark for a correct process.

Question 15
This question was not particularly well done, students failing to use their calculators effectively by calculating $\frac{125^2+173}{9.3-6.8}$ or 125² + 173 ÷ 9.3 – 6.8. The students who gave an incorrect answer usually failed to gain a method mark as they did not show any intermediate steps such as 15 625 or 69.2.
For part (b), many students failed to include zeros and so rounded 15694.2 to 157. Follow through marks from part (a) to part (b) were available but not awarded in many cases.

Question 16

Almost all the students sitting this examination gained the mark in part (a) for the reflection. Unfortunately in part (b) many students were unable to recall the word 'translation' for the type of transformation. It was frequent to gain one mark for the description of the translation, many writing it as '4 squares to the right and 6 squares up' rather than the correct translation vector. In the case of the vector, some of the students put the numbers 4 and 6 the wrong way round.

Question 17

There was a mix of blank responses and fully correct responses for this question. For those that attempted the question, a fully correct graph was often seen. A few students made errors such as wrongly plotting one of the points, but were generally able to gain 3 marks for a correct line through at least three of the correct points. A small minority gained just one mark for a line drawn with a positive gradient going through (0, 2) or for a line in the wrong place, but with the correct gradient.

Question 18

Part (a) was well answered with only a few students not knowing what to do and a few increasing the price of the dress rather than reducing it. Part (b) was answered correctly by about half of the students, but for those who did not gain full marks, they often gained a mark for correctly calculating the actual increase but were unable to progress sufficiently to gain any more credit. Some calculated the percentage increase as a percentage of the new pay rather than the original pay and some gave an answer of 0.04 or 0.4 having not multiplied by 100 or having multiplied by 10.

Question 19

There were fewer correct responses than anticipated, suggesting that students found this question rather challenging. As the answer was given and the students had to demonstrate how to get there, it was important that full working was shown. Many students just repeated the question with no clear process. Some tried decimals, but were unable to deal with the recurring figures and so gained no credit. Those that gained full marks changed the given fractions to improper fractions with a common denominator of 6. Some attempted to write the given fractions as improper fractions but were unable to successfully do so.

Question 20

Very few students gained full marks for this question. In part (a), many students gained a mark for at least finding the curved surface area, but did not notice that the question asked for the total surface area. Some students confused the diameter and the radius, and some used the circumference formula for the area. A few students even found the volume of the cylinder.
For part (b), very few knew what was required for the lower and upper bounds of 30 with many blank responses seen, and some giving answers such as 25 for the lower bound.

Question 21

Although this question was at the more difficult end of the paper, the majority of students were able to gain at least 1 mark for the correct expansion of the bracket and many were able to give the correct answer of −6.75. A few gave 6.75 but with correct working and were able to gain 2 marks.

Question 22

In the majority of cases, blank responses were seen. Students found it very difficult to know what was required as it was not a straightforward trigonometry question. Very few students gained any marks at all and those that did were often unable to find the bearing but achieved three marks out of four for a correct angle.

Summary

Based on their performance on this paper, students are offered the following advice**.** They should:

- be coached in ensuring they read the questions carefully, giving the answer that is required and noting that words in bold type are there to prompt them
- have ample practice on naming shapes and understanding and using mathematical terms such as mean, median and mode
- ensure they show adequate working for all questions, even those where they have relied more or less fully on a calculator
- ensure when rounding a number they do not miss off zero's which will completely change the value of the number
- always check their work carefully

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