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Examiners' Report
Principal Examiner Feedback

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Pearson Edexcel International GCSE
Mathematics A (4MA1) Paper 2FR

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

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 smallest number in the table and selecting El Salvador as their answer.
(1b) A pleasing number of candidates were able to answer this question correctly. Occasional wrong answers given were 'four' or '4', ignoring the place value of the digit.
(1c) This part was found to be the most challenging within question 1, as some candidates only considered rounding in one direction, and frequently gave Denmark at 5871 rounding to 5000.
(1d) Almost all candidates were successful in writing the number in words.

Question 2
The vast majority of candidates had no trouble writing down coordinates for part (a), however finding a point D was problematic for many candidates, with a cross indicated at (6, 2) being a very common error. A much higher proportion of candidates were able to find the midpoint of *AB* and gave the correct coordinates, with only a small minority mis-reading or transposing their coordinates.

Question 3
Naming mathematical shapes is often problematic for foundation tier candidates, although the vast majority managed to identify a cylinder correctly.
Counting edges in part (b) was not well answered, with candidate often missing or miscounting the hidden edges (shown dashed), or missing the short edges, with 8 being a very common incorrect answer.

Question 4
This question was answered well by those candidates who were familiar with the terms mode and range. It was clear that some candidate were not well prepared on this topic area, and hence scored no marks on either part.

Question 5
(5a) Candidates generally answered this question correctly, showing a good understanding of the use of fractions in this context.
(5b) Again, the vast majority of candidates obtained a correct answer – using a calculator is to be encouraged.
(5c) This part was the least well answered out of this question, with many candidates either not being familiar with the phrase 'terminating decimal', or not able to identify this from the fractions given.
(5d) Converting a fraction to a mixed number was a familiar process and this part was answered correctly by a majority of candidates.

(5e) Most candidates were able to identify 25 as a square number.

Question 6
The link between perimeter and side length was not clear to some candidates who were unable to find that the length of the square was 6cm. The perimeter of the shaded rectangle comprises of 10 of these lengths, although a commonly seen error was to calculate 13×6.

Question 7
A significant proportion of candidates were not familiar with simplifying ratios or converting from a ratio into fractions for each parts. Hence the responses tended to be split between fully correct, or totally blank answers.

Question 8
The vast majority of candidates gave the correct answer of 74 and showed the method clearly. Two method marks could be gained if the full method was shown even if the answer was incorrect or not calculated. A fairly common error was to not follow the rules for order of operations, with some candidates adding together the number of cards and fixed fee as their first step, which as an incorrect method gained no marks.

Question 9
The most common error in (i) was to assume that the interior angles of the quadrilateral was 180 and not 360 as it should be. With 360 as the starting point the correct answer of 112 was frequently found for three marks.
In part (ii), only a minority of candidates were able to state that "Angles in a quadrilateral sum to 360", with some candidates restating their working from (i) rather than giving a geometric reason.

Question 10
This question was answered well by virtually all candidates. Showing the full method here is key in securing the final answer of 8. Some made an arithmetical error but with the correct method shown they could gain two method marks.

Question 11
Many candidates were able to score full marks on this question, with a fully correct answer containing all the possible combinations with no duplicates. Candidates would be advised to give the abbreviated names for the combinations, ie TV, TB, TT etc as it saves valuable time in the examination.

Question 12
Many candidates were able to secure the first method mark was gained by showing the intention to add all four values of the ingredients. The total of 855 formed the denominator of a fraction with 330 as the numerator, which some candidates got upside down. From a correct fraction, a good number of candidates were able to the percentage of 38.6 and secure all three marks.

Question 13
There are two sound approaches to finding the answer of 819. Either divide each of the length, width and height by the cube length of 5 to get 13, 7 and 9 which can then be

multiplied together OR find the total volume of the cuboid 102375 and divide by the volume of a cube which is 5×5×5 =125.
Many candidates could find 13,7 and 9 but chose to add rather than multiply and only gained the first method mark. Those who had a limited idea of the relationship between dimensions of a shape and volume formed a significant minority.

Question 14
In general, candidates were not able to make much progress on this question. Many could find the missing sector angle of 110 for Sandeep, however their ability to clearly identify the relationship between sector angle and the number of votes was a major stumbling block. The best candidates were able to use the values given for Ravina to work out that one degree represents 400/160 =2.5 votes which could then be used with the 110 to gain the correct response of 275 votes for full marks.

Question 15
(15a) This question was very straightforward, with almost all candidates giving a correct answer.
(15b) Expanding brackets was completed accurately by many candidates, although some simply added the x or actually squared the $(8 – x)$ bracket.
(15c) Candidates should be reminded to show the expression with values substituted, as sign errors were often made in subsequent working. At least for those who showed a correct expression the first mark was awarded.
(15d) Only the best candidates on this tier were able to correctly rearrange the formula. Common errors were to multiply $(k – t)$ by 2 or to add t to k in the first step.

Question 16
Q16 The key to both parts of this question lay in clearly showing each and every step clearly as fractions finding common denominators where needed and cancelling down to obtain the final required fraction. The majority of correct answers for (b) used 24 as a denominator, although 48 or some other multiple of 24 was acceptable so long as an intermediary step was included.
A few candidates attempted to use decimals throughout and hence no marks could be earned as this was clearly in exercise in showing how fractions could be solved.

Question 17
In part (a) the correct answer of 140 which is the bearing of S from C was rarely seen. The most common incorrect response was 40 which is an angle measured at S which is not a bearing.
For (b) The length of 6cm from C to S was frequently identified and many multiplied by the scale of 500 to obtain a true length of 3000m. At this point two method marks were awarded. Many did not know how to take the next step and divide their answer of 3000 by the length step of 0.44 and hence scored no further marks.

Question 18
This question was answered well by most candidates, however a small number of students showed poor understanding of probability, especially in part (b) where multiplication was often seen. The other common error was to divide answers by 4. Accuracy when adding or subtracting was occasionally lacking.

Question 19
Part (a) was generally well done, with the 78 × 12 = 936 by far the more common approach. Some students correctly found the multiplier as 1.3 but then failed to give final answer as 30% increase. A few candidates attempted to use 720 ÷ 936 which could not lead to a correct answer. In terms of approaches, those using the (1+P/100) route were generally more prone to errors.

Candidates generally found part (b) much more challenging. Before identifying the choice of coupon to be used it was vital that candidates found either the saving or the total cost for each coupon so that comparison could be made using accurate figures. Choosing a coupon without comparable figures did not gain the accuracy mark. Many candidates gained one mark for values of either 288 or 300, or 2112 or 2100, but the majority of responses did not obtain a pair of values that could not be compared, hence one mark was the maximum that could be awarded.

Question 20
In part (a) the majority of candidates were able to give a correct answer, the main error was to use an = or incorrect equality sign, often when the correct answer seen in working. Errors were made when subtracting, since candidates are allowed a calculator they should be reminded to use it to check their working, however simple it may seem. Part (b) was not well answered and many candidates could not deal correctly with the algebraic fraction. Common errors were made as candidates struggled to rearrange the equation, attempting to remove the 7 or the $4x$ out of the fraction without considering the denominator. A few candidates got as far as $8x = 3$ and gave an incorrect answer of $\frac{8}{3}$ rather than $\frac{3}{8}$.

Question 21
Many candidates gained a method mark for finding either the interior or exterior angle of a pentagon or a octagon. The second method mark was gained less frequently for finding angle *IBC* as 27 degrees. Very few then realised that triangle *IBC* was in fact isosceles so that angle x could be found by $(180 - 27) \div 2$. A common error was to incorrectly assume that *IC* bisects the interior angle of the octagon and hence no further marks could be awarded.

Question 22
Q22. The responses to this question fell into those who recognised compound interest and those who thought only of simple interest. Making an acceptable start resulted in one method mark but for full marks an answer in the range 7753 – 7754 was needed with appropriate working. Most correct answers were gained by the shortest method i.e. 7100×1.025^3.

Question 23
Parts (a) and (b) were well answered well, although a slightly higher proportion of errors on (a) as some candidates incorrectly gave 0 as the answer.

Part (c) proved more of a challenge with students being unable to combine the powers of 7 in a meaningful way that allowed them to find the value of m. The most successful students were those who first wrote $7^{206} \times 7^{m} = 7^{211}$, with not many students using the method of writing the linear equation $206 + m - 214 = -3$ to obtain an answer. It was evident that many candidates were not aware of the laws of indices and as a result gained no credit at all.

Question 24

In part (a), the correct equation of $y = -3x + 5$ was infrequently found indicating that this is another topic which needs emphasising as the values for the solution were self-evident on the question paper and just needed placing in the general equation $y = mx + c$.

For (b), a small number of candidates could draw clear lines

at $x = 6$ and $y = 2$ with a number reversing them. However, a difficulty arose with the line for $y = x + 1$, with quite a few drawing either $x = 1$ or $y = x$ in error.

Question 25

This question was a mystery to the majority who did not realise that the key to the question lay in finding the total weight of all tigers and the total weight of Siberian tigers. The difference in these weights gives the total weight of Bengal tigers and therefore division by 28 will give the mean weight of Bengal tigers as 185 kg. The most common error was solving $(260+x) \div 2 = 218$, resulting in an answer of 176kg.

Question 26

This solution relies on using trigonometry to find the length of *AC*. Some spotted that $\cos 30 = 24 \div AC$ but could not rearrange to find $AC = 24 \div \cos 30$. Many candidates gained one mark for finding the arc length *FED* was 9.42 or identifying the method needed to find the semicircle or circumference of circle. Some missed out on this mark as they found the area of a circle. In general, candidates were less successful in pulling together all 3 strands of the problem - finding the hypotenuse, finding the arc length and remembering to subtract 6.

Summary

Based on their performance in this paper, students should:

- 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.
- Practice ‘give a reason for your answer’ type questions where geometric reasons are required for triangles, and quadrilaterals.
- Work on rearranging algebraic fractions, being mindful of inverse operations.

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