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International GCSE
Mathematics A (4MA0) Paper 1F

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International GCSE Mathematics A
Specification 4MA0
Paper 1F

General Introduction to 4MA0

There was an entry of just under 31,400 candidates, 1,800 more than a year ago. This comprised 19,800 from the UK and 11,600 from overseas. The Foundation tier entry fell by 16% but, in terms of numbers of candidates, this was more than compensated for by an 8% increase in the Higher tier entry.

All papers proved to be accessible, giving appropriately entered candidates the opportunity to demonstrate their knowledge and understanding.

Paper 1F

Introduction

Q15 (Pentagon) and Q22 (Sets) proved beyond the majority of candidates but the remaining questions had encouraging success rates. Overall, this paper gave the 1400 candidates the chance to demonstrate positive achievement. Generally, they showed their working clearly.

Report on individual questions

Question 1

Errors were rare on this straightforward starter question.

Question 2

The first three parts of this bar chart question caused few problems. The final part was also well answered, although the ratio was sometimes left unsimplified as 10 : 15, which scored 1 mark out of 2. Answers expressed as fractions received no credit.

Question 3

In part (a), the majority of candidates were able to name the cylinder and the sphere, although 'circle' was sometimes given for the latter. Many gave the name of the pyramid correctly but 'prism' was also popular for this. In part (b), the number of faces, 5, was frequently correct, although 4 appeared regularly. Finding the number of edges proved much more difficult, however, and 5 probably appeared as often as the correct answer, 8. The quality of responses to part (c) varied widely. 24 ($4 \times 3 \times 2$) and 42 (14×3) were common wrong answers for the number. The units of volume were sometimes given as cm^2 and occasionally as cm.

Question 4

Most candidates gave both the correct two terms and an acceptable explanation, usually some variant of "Multiply by 4". There was also a substantial number of correct but less straightforward answers such as "Multiply the difference by 4 and add this on" and "Square root the previous term, double it and then square this." One mark seemed scant reward for the candidate whose explanation was "The *n*th term for this sequence is 4^{n-1}" but at least it brought some joy to the examiner who encountered it. The final part had a fair success rate but, perhaps suspecting a trap, some candidates gave an answer of 4.

Question 5

Both mode and median were generally well understood and many candidates scored full marks.

Question 6

There was a high proportion of correct answers to all parts of this question. In part (a), the fraction was occasionally left unsimplified as $\frac{16}{100}$ but no errors appeared with any great regularity.

Question 7

In the first part, candidates were expected to give a reason which included both "line" and "180°". Many did this. Those who did not often just showed their working instead. There were also many correct answers to the second part; the majority of candidates recognised vertically opposite angles and successfully used the angle sum of a triangle.

Question 8

In part (a), hardly any candidates went wrong in obtaining $\sqrt{19}$ from their calculators and most were able to write their answers to 2 decimal places, although 4.35, 4.4 and, more surprisingly, 4.46 all appeared with some regularity. In part (b), almost all candidates found the value of 16^3 accurately.

Question 9

In the first part, many candidates successfully simplified the expression completely as $3m$; $5m - 2m$ received no credit. The most popular wrong answer was m^3. The simplification in the second part was also often correct. If an error were made, it was usually with the coefficient of y.

Question 10

There was an impressive number of fully correct answers, often the result of accurate and concise methods. There were also many faulty methods; some led to answers such as 24 $\left(\frac{60}{2.5}\right)$ and 484 $\left(\frac{1210}{2.5}\right)$, which appeared regularly, while others occasionally gave results, such as 1.15 and 483,400, which should have aroused candidates' suspicions. A significant number of attempts, $\frac{121-60}{2.5}=24.4$ for example, gained 2 marks for subtraction of 60 and division by 2.5, following an incorrect conversion of 1.21kg to grams.

Question 11

Many candidates listed all the remaining outcomes correctly in part (a). Those who failed to do so were as likely to list too many outcomes as too few, either by reversing the correct outcomes or by including outcomes comprising two numbers from the same spinner. Part (b) proved more difficult, though full marks were still available to those who had scored 1 mark out of 2 in part (a). Even when the list was correct, it was not unusual to see the probability given as a fraction with a denominator of 7, presumably because there were seven outcomes satisfying the required condition.

Question 12

The majority of candidates calculated the cost accurately in the first part, although 30.5 appeared occasionally, the result of keying in $9\times3+7\div2$. Even in this case, if working were shown, 1 mark out of 2 was awarded. There were also many correct answers to the second part, usually obtained using either inverse operations or trial methods. Most candidates understood that an algebraic answer was required in the third part and there were many who scored either 3 marks for a fully correct formula such as $C=\frac{3d+7}{2}$ or 2 marks for $C=3d+7\div2$. Omission of '$C=$' was fairly common and incurred a 1 mark penalty. Formulae with d^3 instead of $3d$ received no credit.

Question 13

A substantial proportion of the candidates analysed this question clearly and produced clear, correct solutions. Many, though, were unable to make a meaningful attempt and gave a wide range of wrong answers including 24 cm (taking the width as 4 cm) and 416 (8 × 52).

Question 14

Errors were rare in part (a) but somewhat more frequent in part (b), where the correct calculator reading was either truncated (1.72) or given to 3 decimal places (1.727). The minority of candidates whose value in part (a) was wrong often gained the mark in part (b) by rounding their value correctly. For example, an answer of −43.3709…, the result of $\frac{24.1}{8.4}-7.8-6.2^2$, was usually rounded correctly.

Question 15

The majority of candidates gained no marks. The method for finding the interior angle sum for a pentagon was clearly not well known and rarely seen, even by those candidates who used 540°; for those candidates who did know this fact, most were able to score full marks. Many candidates understood the need to add the given angles and subtract the result from the angle sum. Many different values of the angle sum were seen; 360° and 720° were popular but most multiples of 10° between 450° and 600° attracted some support. Candidates who worked with the exterior angles were usually successful. There were some ingenious attempts, which involved splitting the shape into triangles and allocating values to the divided interior angles, but these were invariably based on false assumptions and received no credit.

Question 16

In the first part, the factorisation was often correct but, as always with Foundation tier algebra questions, some candidates were unable to make a serious attempt. A minority were unable to make a start to solving the equation in the second part but the rest were at least aware that some sort of rearrangement was required and there was a pleasing number of completely correct solutions. There was a large range of errors in the rearranging, the most common one occurring when 1 was added to −7, the result often being given as 6, −8 or 8. Similarly, the third part was beyond the algebraic skills of some candidates but many scored full marks. A frequent error was to give the constant term as +21 or −4.

Question 17

There were very few errors in part (a) and part (b) also had a high success rate, although a significant minority of candidates used 30 × 0.1 to obtain 3, answering the question for mango juice instead of for orange juice. This received no credit.

Question 18

There was a good success rate for this question. Candidates who gained both marks converted $\frac{5}{6}$ and $\frac{3}{4}$ to either $\frac{10}{12}$ and $\frac{9}{12}$ or to $\frac{20}{24}$ and $\frac{18}{24}$. A small minority attempted to work in decimals, which received no credit, while others contrived to combine the digits 3,5, 6 and 4 in inventive ways; $\frac{5-3}{6\times4}$ was seen on more than one occasion.

Question 19

In the first part, many candidates gained some credit and a fair number scored full marks for a completely correct description of the transformation. If an error occurred, it was most likely to be with the angle, often the omission of 'clockwise'. Combinations of transformations, which receive no credit, appeared frequently, especially combinations of rotations and translations. There was a reasonable number of correct reflections in the second part but there were also many which were incorrect, especially the image obtained by reflecting either triangle **Q** in the y-axis or triangle **P** in the line $y = -x$.

Question 20

This question on ratio proved to be accessible to many candidates, with a variety of appropriate methods being used. However, a large number found $90 \div 3$, $90 \div 5$ and $90 \div 7$ in their attempt to work out the lengths of the sides.

Question 21

In part (a), many candidates scored full marks, usually by successfully finding and giving as their answer an estimate for the total weight of the parcels, as the question required. A sizeable minority found the total weight and then went on to find the mean weight but, as long as the total weight, 444 kg, was explicitly stated in the working, full marks were still awarded. The most common error made by candidates who gained some credit was the use of upper limits or, less often, lower limits instead of halfway values. There were also many incorrect attempts which indicated little understanding. For example, halfway values were added, values from the class intervals were multiplied together and cumulative frequency values were added.

Question 22

In part (a), only a minority listed the members of the sets correctly. Part (b) also proved demanding. Successful explanations either referred to 8, for example, "8 is not an odd number" or showed understanding of the symbol $\notin$, for example, "8 does not belong to A". It was noticeable that some candidates who clearly appreciated that 8 is an even number ticked the 'No' box.

Question 23

The majority of candidates recognised this question as 'Pythagoras' but they were fairly evenly split as to whether they should 'square and add' or 'square and subtract'. Those who chose the former gained no marks, while the majority of those who chose the latter went on to score all 3 marks. If they lost a mark, it was usually because they showed fewer than 3 significant figures in their answer, although this penalty was avoided if they showed 3 or more significant figures in their working. A substantial number of candidates made attempts, usually unsuccessful, to use trigonometry.

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