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Examiners' Report
Principal Examiner Feedback

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In Mathematics A (4MA1) Paper 1F

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4MA1 1F June 2025 Principal Examiner's Report

The majority of questions on this paper were well attempted by this cohort. It was usual to see full methods shown to enable candidates to gain as much credit as possible. Below is a detailed breakdown of the performance by candidates for each question, with a summary of points for improvement based on the performance for this paper given at the end of the document.

Question 1

Part (a) and (b) were answered well.

Part (c) saw less success as a whole array of correct and incorrect answers were seen. Common incorrect answers were not 4 digits and did not use the numbers given in the question, suggesting candidates had not read the question properly or did not understand what it was asking them.

Question 2

This question was answered well on all parts.

In part (b), those that did not score 2 marks often gained 1 mark for an addition with one error or omission. Some candidates wrote down the correct calculation but gave an incorrect answer.

Part (c) also saw some incorrect answers as candidates struggled to get to grips with drawing three quarters of a circle.

Question 3

Part (a) was answered well; common incorrect answers were 5 and 8.

Part (b) saw mixed results; it is clear that some candidates do not understand the definitions of vertices for 3D shapes. The common incorrect answer was 12.

In (c) a significant number of candidates gave a correct answer but other incorrect answers were seen with radius being seen most. Very few candidates knew the definition of a tangent and many different incorrect answers were seen such as circumference and chord.

Question 4

Both parts of this question were answered well with almost all candidates giving correct answers of $20e$ and 15.

Question 5

Part (a) was answered well; the most common incorrect answer was 6.

Part (b) was answered well; the most common incorrect answer was 19%.

In part (c) candidates scored 2 marks for an answer of $\frac{4}{5}$. Of those that didn't, some scored 1 mark by either giving a correct equivalent fraction such as $\frac{16}{20}$ or for an answer of $\frac{1}{5}$ or for any fraction that will cancel then written in its simplest form e.g. $\frac{15}{20}=\frac{3}{4}$.

Question 6

Part (a) was answered well as candidates could score 1 mark for an answer of 23. Common incorrect answers included 24 and 25.

In part (b) one mark could be gained for an explanation similar to those given in the mark scheme; common incorrect answers usually revolved around not indicating that the terms were increasing by 4 from term-to-term.

Part (c) saw less success, some candidates managed to get a correct answer of 51 but there were many different incorrect answers, usually in and around 51 suggesting candidates attempted to add many 4's but couldn't do it accurately.

Question 7

Of those that didn't score 4 marks, many scored 2 marks either for a method to reach the reduced price of two calculators or for an answer of 29.9(0) or 36.6(0) – these were awarded Special Case B2 for the candidate who worked out the discounted price at ¼ of £26.80 and used that and the candidate who only included one calculator but did everything else correctly. Some candidates made a correct start, usually for finding the normal price of 2 calculators, but then went wrong after that and gained 1 mark only.

Question 8

In (a), those that did not gain 2 marks usually gained 0 with 3 or 4 incorrect values in the table.

In (b), those that gained only one mark often plotted the points without the line, or followed through their incorrect table (provided B1 had been scored in (a)) to gain M1A0. Some candidates appeared to have very little idea of how to go

about this question and could not produce any correct values in the table or a straight line graph.

Question 9

In part (a) 4 correct values needed to be produced to gain 3 marks. Of those that didn't, 1 mark was gained for finding the angle for poached, but many were not able to work with the frequency and angle for scrambled and find the number of degrees per person.

In part (b) there was more success, partly due to the mark scheme awarding B1 for a correct fraction or percentage or decimal or following through their total frequency from a complete frequency column and this was often seen.

Question 10

Candidates were able to gain 3 marks for a correct answer of 105. Of those that didn't, many gained one mark for finding the number of boxes along one dimension of the crate but then going wrong after that (usually by adding 7, 3 and 5 instead of multiplying) or for finding the volume of the crate or the box. Some candidates did not know how to go about beginning the method for this question and attempted some calculations with the length of the edges of the cuboids.

Question 11

This question was answered well, candidates could score 2 marks for a correct answer of 295. Of those that didn't, an incorrect start was usually the issue by dividing 708 by either 5 or 7.

Question 12

Part (a) was answered well as candidates could score 2 marks for an answer of 3 hours and 25 minutes. Of those that didn't, most gained 1 mark for one of the values correct.

Part (b) was also answered well as candidates could score 2 marks for an answer of 40; those that didn't generally scored 0 marks, with 48 ÷ 100 × 120 a common incorrect method.

Question 13

This question was answered well. Fully complete methods were seen in two main forms; the use of equivalent fractions, usually $\frac{12}{28}$ and $\frac{7}{28}$, or using calculations that would lead to 12, 7 and 28 as outlined in the mark scheme. Those that didn't gain 2 marks usually gained 0, common incorrect methods included no

attempt to find a common denominator and converting the fractions to decimals and working with those.

Question 14

Part (a) was answered well as candidates were able to gain 1 mark for a correct answer. Common incorrect answers were $x - 7x$ and $-7x^2$.

Part (b) saw mixed results as some candidates gained 1 mark; those that gained 0 marks did not understand the meaning of 'factorise'; answers such as $-2y$ were often seen.

Part (c) was answered well as candidates could gain 3 marks for a correct answer. Of those that didn't, some gained 1 mark for correctly substituting into the equation but then could not successfully go on to solve the equation.

Question 15

This question saw mixed results and the full range of marks awarded. A significant number of the cohort did manage to work through the method and give a correct answer of 1054 for 4 marks. Of those that didn't, some gained 1 mark, usually for working out the total income for the chocolate cakes, but could go no further as they were unable to work with the ratio correctly. Commonly seen incorrect methods were to multiply the chocolate and lemon sale prices by 5 and 7 respectively or to treat 40 as the total number of cakes, the latter could gain SCB2 or SCB1 if done accurately.

Question 16

1 Part (a) was answered well as candidates were able gain 1 mark for a correct answer of 17; common incorrect answers were 8, 9 and 23.

2

3 Part (b) was answered well, those that didn't gain 2 marks for a correct answer, 1 mark was often gained for an answer of $\frac{6}{m}$ where $m > 6$ or $\frac{n}{25}$ where $n < 25$.

Question 17

This question saw mixed results with the full range of marks awarded. Some candidates were able to correctly find the total area of the shape and divide by 4 to reach 14.25; most candidates at this point rounded up to 15 but a small number rounded down to 14, losing the final mark. It was also common to see candidates using multiples of 4 for their area rather than dividing by 4 and this was generally done successfully. Some candidates split the shape into a rectangle and triangle and found the number of tins for each area and then added the two together. Some candidates were able to find the area of the rectangle successfully but failed to divide by 2 when finding the area of the triangle; most of these candidates gained 2 marks for then going on to divide by 4. A common error was to not work with area at all but use the given

dimensions to attempt to find perimeter or volume; these candidates could still gain the 3rd M mark using the left hand column in the mark scheme.

Question 18

Both parts of this question saw mixed results.

In (a), some candidates were able to give a correct inequality for 1 mark, some also gave their answer in an alternative form as per the mark scheme e.g. 5 – 10. A common incorrect answer was 40.

In (b) the whole range of marks were seen on a regular basis. Some candidates were able to gain full marks for an answer of 9.2; of those that didn't, many gained 2 marks, usually for at least 4 correct products added but then going on to divide by an incorrect value (e.g. 5 or 62.5), or for consistent use of values within the intervals (usually end points or 3, 8, 13, 18, 23) and then dividing by 100. Completely incorrect methods were often seen - dividing the sum of the mid-interval values by 5 was the most common - with a significant proportion of the cohort gaining 0 marks.

Question 19

Part (a) saw mixed results with some candidates able to gain 4 marks for an answer of 12.5. Of those that didn't, some gained 2 marks for a method to find out the total income (1920) and then working out the profit (240), these candidates usually went on to divide profit by income instead of expenditure. Some candidates only scored one mark as they found the total income (1920) but then divided 1920 by 2160.

Part (b) saw more success than part (c). Some candidates did not know what was meant by an upper or lower bound, those that did could not produce the correct value for example 124 was often seen for (c).

Question 20

For those who scored 1 mark, it was usually for a method to find the interior angle of the polygon (162). Some candidates were able to find the exterior angle (18) and then divide into the 360 to get the correct answer of 20; this was the most common method for the candidates who scored 4 marks. Many candidates did not know how to proceed once they had worked out the interior angle and this is certainly an area that this cohort could do with spending more time on.

Question 21

Parts (a) and (b) were answered well. Common incorrect answers were 35 for (a) and $\frac{8}{3}$ or 2.666… for (b).

Part (c) saw mixed results. Some candidates managed to gain 1 mark and this was usually for an answer in the form $ka^{12}r^6$ where k was incorrect, usually 5 or 15. Common incorrect answers often had powers of 7 and 5 for a and r respectively.

Question 22

Some candidates managed to gain 3 marks for a correct answer on this reverse percentage question. Of those that didn't, most scored 0 as they were unable to grasp the concept that 198 was equal to 72% of the normal price, with the common incorrect method being to increase 198 by 28%.

Question 23

In part (a), many candidates were unable to correctly remove the fraction and expand the bracket in a correct equation, with common incorrect equations being $6x - 4 = 3 + 2x$ or $6x - 24 = 18 + 12x$. Candidates could still gain the 2nd M mark without the first as long as they had a 4 term equation and then rearranged it with terms in x on one side of the equation and number terms on the other and this was sometimes seen. Many candidates did not know how to make a correct start to solving this equation.

In part (b)(i) candidates needed to factorise correctly for 2 marks. Some candidates had an answer in the form $(y \pm 6)(y \pm 5)$ but with incorrect signs, gaining 1 mark.

In part (b)(ii) the solutions had to follow through their factorisation in part (i) and for incorrect solutions the candidate either did not have this from part (i) or were not able to extract the solutions correctly.

Question 24

Some candidates set up an equation using the volume of a cylinder formula whereas others went straight to finding the area of the circle and then dividing the volume by this result, gaining 3 marks for an answer in the range 19.3 – 19.4. Some candidates managed to gain 1 mark for the area of the circle but could go no further, and there was a large number who produced no correct start whatsoever; some missed the power of 2 from the 8 and others did $8 \times \pi^2$.

Question 25

There were more correct answers seen on part (b) than part (a) on this question. In part (a), some candidates were unable to first write 520 million as an ordinary number or if they were successful they gave an incorrect answer such as 520×10^6.

Part (b) also saw varied success with common incorrect answers being 0.000 879 and 0.000 087 5.

In (c), some candidates scored 1 mark, usually for 35×10^{-138} or 3.5×10^{n} where
$n \neq -137$.

Question 26

Some candidates did not recognise the need for trigonometry and instead tried a few calculations with the given dimensions. Some candidates did produce correct methods for the height of the trapezium and / or the base of the triangle but could not go any further. It was clear that some did not even recognise that the formula for the area of a trapezium is given on page 2 of the question paper which shows a lack of familiarity with the formula sheet.

Summary

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Based on their performance in this paper, candidates should:

- learn how to form 4 digit numbers abiding by given descriptions such as large, even
- understand what a vertex is / vertices are for a 3D-shape
- learn the names for the parts of a circle
- understand the mathematical meaning of the word 'factorise'
- practise finding the area of compound shapes involving rectangles and triangles
- remember to divide base × height by 2 when finding the area of a triangle
- understand that when buying e.g. the number of tins needed to paint an area, the decimal number required should be rounded up, not down
- learn how to work out one number as a percentage of another in practical scenarios e.g. calculating profit
- understand the definition of an upper or lower bound and practise how to find them
- practise problems involving interior and exterior angles
- practise indices problems with brackets e.g. simplify fully $(5a^4r^2)^3$
- recognise a reverse percentage situation
- practise solving linear equations with fractional coefficients
- practise solving quadratic equations by factorising
- practise arithmetic with numbers in standard form
- become more familiar with the information given on page 2 on the formula sheet

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