Pearson Edexcel

Examiners' Report
Principal Examiner Feedback

Summer 2025

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

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IGCSE Mathematics 4MA1 2F Principal Examiners Report

Candidates who were well prepared for this paper were able to make a good attempt at all questions. It was encouraging to see many candidates clearly showing their working. Using everyday mathematics and finding percentages were some topics that some candidates found challenging.

On the whole, working was shown and was easy to follow through. There were some instances where candidates failed to read the question properly. For example, in Q14, some candidates did not interpret the question correctly; they did not find 24% to find the number of red cars.

A striking weakness in candidates was solving problems with number work, compound interest, applying Pythagoras theorem and working out problems involving fractions and percentages. On the whole, problem solving questions and questions assessing mathematical reasoning were not tackled well, this was particularly apparent in questions 18, 20 and 23.

Comments on individual questions

Question 1

Candidates were presented with a table showing five 6 digit numbers. Almost all were able to (a) select the largest, (b) write 163,800 in words, (c) give the place value of the 7 in 406752 and (e) work out the difference between two of the numbers. In (b), the three thousand was sometimes omitted and millions made an appearance, and in (c) hundredths was occasionally circled rather than hundreds. A little less well done was part (d), with only three-quarters of candidates gaining the mark for writing 173,626 correct to the nearest thousand. 173,000 was seen quite often instead of the correct 174,000 and also 170,000 and 180,000 and 200,000.

Question 2

In part (a), 20 animals were listed and candidates were asked to tally and give the frequencies for each of the five different types of animal. All but a tiny minority could do this to gain the 2 marks; miscounting one or two still gave the opportunity for 1 mark. The frequencies written only as probabilities or percentages scored 1 mark. Almost all candidates were able to draw a bar graph in part (b), showing the frequencies from part (a) The most usual reason for losing a mark was where the bars were not labelled.

Question 3

This first algebra question on the paper proved accessible to a high number of candidates. They could correctly find $4d$ as the sum in part (a) and w^5 as the product in part (b), clearly understanding the difference between these two questions, although a few wrote d^4 and $5w$. Solving $6x = 42$ gave over 90% of candidates an opportunity to gain a mark. Collecting like terms in part (d) provided most candidates the opportunity to gain 2 marks for $10r + 5y$ or 1 mark for either one of these, or for $10r - 5y$, or for a correct expression incorrectly simplified, for example to 15*ry*. 10*r* + 13*y* was seen, where the terms in *y* had been added instead of subtracted.

Question 4

Reading a value marked with an arrow on a number line and marking a value on a number line was well answered by over 80% of candidates. Where errors were made, it was by candidates who did not take into account how many divisions there were between the numbers on the line.

Question 5

Around 90% of candidates were able to give the coordinates of a point shown on a grid and to plot a point given its coordinates. Loss of marks was usually because candidates got *x* and *y* the wrong way round. In part (c), candidates were asked for the coordinates of a midpoint, which under three-quarters of candidates were able to do. Some understood midpoint, shown by them marking the correct point on the grid, which gained them 1 mark, but were not able to write down the coordinates correctly. Others attempted to find the midpoint using calculations but often applied an incorrect method such as $\left(\frac{x_1 - x_2}{2}, \frac{y_1 - y_2}{2}\right)$.

Question 6

Just under three-quarters of candidates were able to change an improper fraction into a mixed number, with a rare few writing it as a decimal, more could select two equivalent fractions in a list of five fractions and over 90% could write 0.3 as a fraction.

Question 7

This problem solving question required candidates to find the cost of two cupcakes given the cost of three, subtract this from $4.50 to find the cost of five doughnuts and divide this by five to find the cost of one doughnut. Three quarters of candidates successfully worked through these stages to gain 4 marks. Others gained partial marks for one or two interim steps. One error that was seen to occur was dividing the wrong way round (3 ÷ 2.25) for the first step; if working continued correctly from this, candidates could gain 1 or 2 marks. Other incorrect attempts saw candidates simply dividing $4.50 (the cost of two cupcakes and five doughnuts) by 2, sometimes then dividing this by five. For students who achieved two marks, the errors occurred as they divided 5 by 3.

Question 8

While about two-thirds of candidates could use vertically opposite angles and the angle properties of an isosceles triangle to find the size of an angle for 3 marks, nearly 20 % failed to gain a mark. Subtracting 104° from 180° was a common and relevant first step and could be awarded with M1 but not if the resultant 76° was labelled on the diagram in a wrong position. Marking the vertically opposite

104° in the correct position on the diagram, even with no further correct working, enabled a good number of candidates to gain 1 mark.

Question 9

Given 2 litres of juice and 180 millilitres being poured into each of some empty cups, candidates were asked to work out how much juice would be left, if as many cups as possible were filled. Two-thirds could start with a correct conversion, divide 2000 by 180 to give 11.11… , realise that only 11 cups could be filled and work out that 1980 millilitres would be needed for this, with 20 millilitres left over. Of the other candidates, a good number were able to gain 2 marks for getting as far as 11. 11… , either stopping there or using this non-integer value to try to find the amount of juice used. Candidates whose initial conversion of 2 litres to millilitres was wrong, most usually 200, could still be awarded with the first method mark for their value divided by 180. Some candidates used repeated subtraction or addition and this was recognised as an acceptable method.

Question 10

Candidates were presented with a calculation, with a step of incorrect working and an incorrect answer. They were asked to explain what was wrong. Over half gained the mark by reference to the fact that the two negative numbers should have resulted in a positive value when multiplied. While some candidates found it hard to articulate this, their attempts most often showed sufficient understanding for the mark to be awarded. Giving the correct answer to the calculation was also rewarded with the mark, which benefitted some candidates who could not properly explain in words. Incorrect responses included vague mention of not using BIDMAS or that brackets should have been used, plus the occasional "It's not wrong".

In (b), candidates were asked to list positive odd numbers less than or equal to 9. Around two-thirds showed all five numbers for 2 marks or four numbers for 1 mark. Where a number was omitted, this was most commonly the 9 and a little less often the 1. Of those who were not able to gain a mark, this was usually for writing only three numbers, often 3, 5, 7 or 3, 6, 9 or for writing all the numbers from 1 – 9 or for writing even numbers.

Question 11

Two-way tables are well recognised by candidates and 90% candidates gained all 3 marks for correctly finding the 6 missing values, 2 marks for 4 or 5 values or 1 mark for 2 or 3 values. In part (b), the question asked for the probability that a child, chosen at random from those playing cricket, played their cricket on Monday. Just under half the candidates selected the correct values from the table and gave their probability answer in a correct form, most usually a fraction. The most common errors were to use the total number of children playing sport on Monday or the total number of children on which to base their probability answer.

Question 12

In part (a), candidates were asked to make y the subject of $w = 3y - d$ and about a third of candidates could do this for 2 marks. Some gained 1 mark, by starting with $3y = w + d$ and either stopping there or proceeding with an incorrect second step. Answers of $w + d \div 3$ with no brackets gained 1 mark; this was taken as a correct intention but written in a mathematically incorrect way. The most commonly seen false start was to subtract d from w to give $3y = w - d$. Other incorrect responses saw expressions with wd and division of only w or d by 3. It was disappointing to note how many students just wrote their answer without showing any steps along the way. This invariably led to an incorrect answer.

Part (b) was correctly answered by just under half the candidates, for finding the correct formula ($T = 12b + 3p$) for the total number of crayons in b boxes and p packets. $T = b + p$ was a common wrong answer but gained 1 of the 3 marks. Where a correctly seen answer was wrongly simplified for the answer line, most usually $12b + 3p = 15T$, only 2 marks could be awarded. Where the otherwise correct answer was given as a product rather than as a sum, only 1 mark was given. Formulae that used powers, $b^{12} + p^3$ were noticeably seen but were not worthy of credit.

Question 13

Using a calculator to evaluate a numerical expression and write down all the figures on their calculator display enabled over 80% of candidates to gain the 2 marks. One mark was sometimes lost by over-rounding or by showing the correct evaluation of only the numerator or the denominator. For those who scored no marks, it was usually for not taking account of BIDMAS in how they entered the given values into their calculator.

Question 14

Multiplying 125 (cars made per hour) by 9 (hours per day) and by 5 (days per week) gave most candidates an easy first mark in this problem solving question for finding the total number of cars made each week. 90% of candidates progressed this far, but only two-thirds overall could proceed to find 24% of 5625. The first mark could also be gained for the product of any two of the values, which was to the benefit of a large number of candidates. A noticeable error in trying to work out 24% was to divide by 24 and multiply by 100. It was apparent from seeing 24% × 5625 leading to a range of incorrect answers that other errors were made but it was unclear what these might have been. 24% x 5625 is not in itself a method; candidates need to show something like 5625 × 0.24 or $\frac{5625}{100} \times 24$

Question 15

It continues to be the case that many candidates mix up the formulae for circumference and area of circles, with the area formula, and incorrect variations of it, being selected more often than circumference, which was the one needed in this question. Together with the incorrect use of formulae like πr or $2\pi d$ or $r\pi^2$ this meant that only about one-third of candidates could be awarded with the 2 marks, and almost two-thirds scored no marks.

Question 16

Majority of the candidates were unable to gain the marks on this bearings question. Given the bearing (073°) of *B* from *A* on a diagram (not drawn accurately), the question asked for the bearing of *A* from *B*. A handful found this, either by subtracting 73 from 180 to get 107 and then subtracting 107 from 360 or, less often, by adding 73 to 180. 73 and 107 featured regularly as answers; if they were shown in a correct position on the diagram around *B* this gained a mark. There were a few right answers and many wrong ones based on candidates measuring the bearing given at *A* or one of the angles at *B* but as the diagram was not drawn accurately this gained no credit. There were a high number of non-responses.

Question 17

This proportion question on finding quantities based on a recipe for 4 people proved very accessible, with nearly 90% getting both marks in part (a) and over 60% in part (b). In part (b), a noticeable number of candidates found the correct scale factor of 4.5, for 1 mark, but rounded this to 5 before multiplying it by 4 or simply leaving their answer as 5 In this, and other questions across the paper, candidates should be encouraged not to over-round figures in their working.

Question 18

This required working out 3 numbers missing from a list of 6 numbers, where the range was 10, the median 7.5 and the mode 6. Given the highest number was 14, the high majority of candidates got 1 mark for writing 4 as the lowest number. 6 was the value needed on the second blank card and this was also found by a good number of candidates. Where 6 was not on the second card, if it was written elsewhere to give a mode of 6 for 6 numbers seen, 1 mark could be gained. The median, 7.5, of the numbers lay between 6 and the missing number and 9 appeared regularly; however, this was the least well done part of the question. 7.5 itself was often written on the card and sometimes 8

Question 19

An enlargement with scale factor 3 had to be drawn in part (a) and over half the candidates were able to produce a shape of the correct size for 1 mark. However, using the centre (0, 1) proved more problematical and the majority of the shapes were incorrectly positioned on the grid, so many candidates were not able to gain the second mark. Other "L" shapes appeared with a variety of dimensions and around 40% did not score a mark.

In part (b), candidates' ability to describe a given transformation has generally improved and 60% were able to gain at least 1 mark, for stating rotation (without mention of other transformations) or for stating the angle of 180° or for stating the centre as a coordinate pair (5, 5) (without using a vector). About one-quarter were able to give all three of these. An answer of reflection appeared relatively often.

Question 20

This fractions question asked candidates to show that a given answer was correct for the subtraction of two mixed numbers. About a third could convert the mixed numbers to improper fractions, write them correctly with a common denominator, subtract and conclude with the given answer for 3 marks. About a quarter gained 1 mark for showing a conversion to improper fractions. Incomplete working was usually when the common denominator fractions were omitted or where conclusion was not shown through to the given answer. Nearly 40% of candidates did not get a mark, either because they showed incorrect working or from making no attempt at the question, which was frequent. There was a mix of approaches as to when they showed the equality to the right hand side of the problem, some doing this in the first line of their working by converting to a top-heavy fraction whilst others showed this as their final step – either were acceptable.

Question 21

About a quarter of candidates gained 2 marks for constructing a perpendicular bisector of a given line, showing their two pairs of intersecting arcs, which they joined to produce the line. Some constructed the arcs but then failed to draw the line, losing them one of the marks. Some were able to draw a perpendicular line but did so without the required construction; this too provided 1 mark. Sometimes the two pairs of intersecting arcs were drawn so close together that it was not possible to discern where the line should be drawn. There were a noticeable number of responses with seemingly random curves drawn using a compass and many non-responses.

Question 22

In this linear similarity question, around half the candidates gained 2 marks and around half gained no marks; this was true for part (a) and part (b). Candidates who understood the topic readily found the scale factor and applied it correctly to work out the missing lengths. The error seen most often was to find the difference between corresponding sides and add or subtract that value to another side to find the length of its corresponding side. Finding the difference between 4 and 10 gave 6 and thus 5 + 6 = 11 and 24 − 6 = 18 were commonly seen wrong answers. Attempts at Pythagoras, trigonometry and area were seen, as were blank responses.

Question 23

Most candidates made an attempt at this question and over half scored all 4 or 3 marks. However, just under a third did not gain any marks. £240 had to be shared in the ratios 3 : 4 : 5 Having found the amount each of three people had, £10 was given by two of the people to the third person. The resulting amounts had to be given as ratios in their simplest form. The most common reason for 3 marks rather than 4 was for ratios given as 80 : 70 : 90 or as 4 : 3.5 : 4.5, neither of which were in simplest form. A common starting error was to divide 240 by 3, by 4 and by 5, sometimes leaving 80, 60 and 48 as an answer and sometimes doing some further working. Another wrong starting point was to divide £240 equally between the three people.

Question 24

This was a standard repeated percentage question but it is disappointing to see how many candidates still work as for simple interest. Any correct start with simple interest gained 1 mark but the other 2 marks were inevitably lost. Encouraging though is the number of candidates who now use the most efficient method of finding compound interest for 3 years by doing 4000 x 1.07^3 Almost everyone using this method scored full marks. A year on year approach can also be rewarded with 3 marks, and a good number of candidates successfully gained the 3 marks in this way, but the potential for numerical errors and for premature rounding is high. An error seen regularly each year is for candidates to work with 1.7 or 0.7 instead of 1.07 or 0.07, which leads to no marks. It is also worth pointing out again that 7%× 4000 is not in itself a method. Candidates need to show a method such as 4000 × 0.07 or $\frac{7}{100}\times 4000$. Nearly a quarter of candidates did not gain any marks.

Question 25

With few exceptions, candidates seem to have taken on board the need to show algebra in a simultaneous equations question and that simply writing down the solutions will not gain any marks. The first method mark was for equating coefficients and subtracting, or for substitution of one variable into the other equation. Of those who could deal correctly with the directed number aspect involved in the subtraction and arrive at the correct solution for their first variable, almost all went on to find the second variable correctly and gain all 3 marks. This was the case for about 20% of candidates. Dealing with positive and negative numbers was a stumbling block for some but if their method was correct, 1 mark was given. Even with an incorrect value, if this was correctly substituted into an equation, the second method mark followed, and about 10% benefitted from this. The most obvious errors were not multiplying all the terms in an equation, adding instead of subtracting, simply adding or subtracting the original equations with no equating of coefficients and ignoring the term in x or the term in y and only working with part of one equation. There were also a noticeable number of blanks. Overall, around two-thirds of candidates did not get a mark on this question.

Question 26

Although many responses to solving a linear inequality in part (a) showed some algebraic terms, much of it combined the terms and numbers from the question in ways that were both wrong and random. $7 - 3t$ often appeared as $4t$ with $2t + 15$ as $17t$ and then an answer of $4t < 17t$ or variations on this was given. Again, dealing with the positive and negative terms caused many to make errors. The positive 7 on the left hand side was added to the 15 on the right hand side and 22 was regularly seen. Subtracting $2t$ from the RHS was subtracted or added from/to $- 3t$ on the LHS to give t or $-t$. Three-quarters of the candidates gained no marks. Some were able to progress as for as $5t > -8$ and from there to $t > -1.6$ or an equivalent for 2 marks, while others did not divide by 5 or divided by −5 but got 1 mark for their inequality with $5t$.

In part (b), giving the three inequalities that defined a triangular region on a grid proved challenging for the candidates, with only around 15% able to get 1, 2 or 3 marks. Almost none could give $x + y < 9$, but some managed better with $x > 2$ and $y > 3$. For those who had some understanding, the mark was sometimes lost as the inequality signs were reversed; if this was the case for all 3 inequalities 2 marks could be awarded. Writing all three equations of the lines correctly gained a few candidates 1 mark. A commonly appearing wrong answer was for the coordinates of the points of intersection of the three lines to be shown.

In both parts, a noticeable number of candidates did not make an attempt at this question.

Question 27

Just under half the candidates gained at least one mark in this multi-step problem solving question, with nearly 20% awarded 4 or 5 marks. A further quarter scored 2 marks. The most efficient way of finding the length *CD* was to use Pythagoras' theorem in the smaller right-angled triangle and then again in the larger right-angled triangle. The initial application of the theorem usually resulted in the first 2 marks being given. Those who used it in the larger right-angled triangle could score 2 more marks and if they then subtracted the given length of *CB* gained the final mark; this latter step was sometimes overlooked, meaning the final A mark was lost. After the first step of working, a frequent mistake was to try to use Pythagoras' theorem in triangle *ACD*, which was not right-angled and hence no further marks could be given. There were a few attempts to work with trigonometry and while it was possible for this to be successful, almost all such responses gained no marks, as they showed little understanding, which was clear from seeing things like tan 16cm. Blank responses were noticeable.

Question 28

This probability question had 17 red counters, 28 blue counters and some orange counters in a bag. The probability of taking at random an orange counter was 4/9 To find the number of orange counters, candidates needed to realise that the probability of taking one of the 45 red or blue counters was 5/9. This was sufficient to gain the first mark and a high number who appreciated this could readily progress to work out the number of orange counters. A quarter of candidates were awarded all 3 marks, which is very encouraging for the final question on the paper. The most common, and incorrect approach, was simply to find 4/9 of 45 and this gained no marks. Non-responses and also random combining of numbers were seen, including some trial and improvement, but this latter working cannot gain method marks.

Summary

Based on their performance in this paper, candidates should:

- Interpret and solve everyday problems
- learn to derive and simplify algebraic expressions
- learn when and how to apply Pythagoras theorem
- show clear working when answering problem solving questions
- 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.
- become more competent with the use of negative integers in calculations