Pearson Edexcel

Examiners' Report
Principal Examiner Feedback

Summer 2025

Pearson Edexcel International GCSE
In Mathematics A (4MA1) Paper 1H

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4MA1 1H 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) was answered well, alternative forms were accepted such as 5 – 10 but most gave their answer using the correct inequality interval.

Part (b) was also answered well where 4 marks could be gained for an answer of 9.2. Of those that didn't, it was common to see one error made with the products but this could still lead to 3 marks if the rest of the method was correct. Some candidates used other values consistent within the intervals such as the end points; the values 3, 8, 13, 18, 23 (i.e. 3 km into each interval) were also commonly seen. Some candidates reached an accurate estimate for the total distance of 920 but then divided by some value other than 100 such as 5 (total number of intervals) or 62.5 (sum of the midpoints). Instances of choice of method were seen on numerous occasions where candidates showed correct working, sometimes even a fully correct method and answer, but then started again with an incorrect method and gave this answer on the answer line which, as per the guidance on page 4 of the mark scheme, led to 0 marks.

Question 2

Part (a) was answered well where 4 marks could be gained for a correct answer of 12.5. Of those that didn't, it was common to see solutions end or go wrong after the 2nd M mark e.g. once a method to find the profit had been gained, candidates then did not know how to use this to find the percentage profit. The methods that went wrong usually involved dividing the profit by the income (2160) rather than the expenditure (1920). Some candidates managed to calculate the expenditure but then divided this by the income and multiplied by 100, gaining one mark only.

Part (b) was answered very well; those that didn't gain 1 mark gave answers such as 8.75 or 8.25.

Part (c) was also answered well, most correct answers were 125 but some gave $124.\dot{9}$ which was accepted. Common incorrect answers were 122.5 and 124.9.

Question 3

Despite this being early on in the paper, the full range of marks were awarded. Both methods from the mark scheme were often seen, dividing the exterior angle (18) into 360 or setting up and solving an equation using the sum of interior angles formula. Some candidates reached 162 and used a trial and improvement method; if the correct answer was reached then 4 marks were awarded, otherwise only 1 mark for 162. Some candidates were able to produce a method to find the interior angle but could go no further as they could not make the link between the interior and exterior angle or use the sum of interior angles formula.

Question 4

Parts (a) and (b) were answered very well where 1 mark could be gained for each part; answers of x^{12} and y^5 were accepted as alternatives to answers of 12 and 5 respectively.

Part (c) was also answered well where a correct answer scored 2 marks. Of those that didn't, it was common to see B1 scored for a product with 2 out of 3 parts correct; it was most often the numerical coefficient that was not correct, with 5, 15 and 25 all seen on a regular basis.

Question 5

This reverse percentage question was answered well. Of those that didn't score full marks, many scored 0 marks with an incorrect method such as increasing 198 by 28%, with many failing to grapple with the idea that 198 was equal to 72% of the normal price.

Question 6

Part (a) was answered well, the question required clear algebraic working and this cohort followed this instruction as correct answers were accompanied by a method worth at least M1. Some candidates made an incorrect start and were unable to remove the fraction and expand the bracket in a correct equation; these candidates could still gain the 2nd M1 for correctly rearranging their equation of the form $ax + b = cx + d$ to get the x terms on one side and the numbers terms on the other side, and this was often seen.

Part (b) was answered well as 2 marks could be gained for a correct factorisation in part (i) and 1 mark for correct solutions in part (ii). In (i), of those that didn't gain 2 marks there were many ways to gain 1 mark as highlighted in the mark scheme and these were seen often. Even if the correct factorisation was not gained, B1 follow through could be gained if the correct factors were given dependent on a factorisation in the form $(y + a)(y + b)$ in (i).

Question 7

This question was answered very well as 3 marks could be gained for an answer within the stated range. Of those that didn't, it was generally an inability to use/lack or knowledge of the formula for the volume of a cylinder, one which is given on page 2 of the exam paper. Some candidates were able to gain one mark for the area of the circle but could go no further as they were unable to rearrange the formula to find h.

Question 8

Parts (a) and (b) were answered very well as candidates could gain one mark on each. For the candidates who didn't gain one mark in (a), the error was usually to give the answer as an ordinary number e.g. 520,000,000 instead of in standard form.

In (b) it was common to see candidates give an incorrect digit at the end of the number e.g. 0.0000875.

Part (c) saw mixed results with marks of 0, 1 and 2 regularly seen. Of those that did not gain 2 marks, many gained 1, usually for 35×10^{-138} or 3.5×10^{n} where $n \neq -137$. There were a significant number of candidates who gained 0 marks and commonly seen incorrect answers included 0 (presumably by inputting into a calculator) or a general lack of understanding of how to manipulate the calculation.

Question 9

Some candidates gained full marks on this question. Of those that didn't, many failed to understand that a perpendicular needed to be dropped down from A to help with finding the height and base of the triangle, and thus gaining no marks (unless they found the area of triangle ADC but this was seldom seen). For those that did work with the right-angled triangle, both trigonometry and Pythagoras were seen in equal abundance. Candidates should take care with order of operations as some did not square the whole term $6\sqrt{3}$ leading to an inaccurate answer. Some candidates produced excellent methods, reaching values for the height and base of the triangle and the length AB but then did not substitute the correct values into the area of a trapezium formula, gaining no further marks.

Question 10

This question was answered well as candidates could gain 1 mark on part (a) and 2 marks on part (b). Of those that didn't, some made error(s) on (a) and therefore the maximum that could be gained on (b) was one mark (unless a correct curve was produced). Candidates should note that a curve is what was required, some managed to plot correct points but joined them with straight line segments rather than a curve, losing the A mark. There was a small cohort of

candidates who plotted the correct points but did not join these points up with a curve.

Question 11

This question was answered well with an answer in the stated range scoring 2 marks. Of those that didn't, most scored 0 as they were either unable to work with area of a circle formula (instead using circumference) or could not use the fraction $\frac{140}{360}$ correctly. Some candidates converted the fraction to a decimal but rounded prematurely leading to an inaccurate answer; candidates should be encouraged to use exact fractions wherever possible. Some also had the correct figures for the fraction but the numerator and denominator mixed up e.g. $\frac{360}{140}$.

Question 12

This question saw mixed results with the full range of marks awarded on a regular basis. Some candidates were able to write the fractions with a common denominator and successfully add and simplify to gain 3 marks. Of those that didn't, many earned 2 marks for correct fractions with a common denominator with brackets expanded correctly but their answer had not been fully simplified, typically $\frac{34x-12}{24x}$ was seen as a final answer. Some candidates managed to reach the correct, simplified fraction but then incorrectly attempted to simplify further, losing the A mark. Some candidates miscopied expressions from one line of working to the next – dropping the *x* from the denominator was common – candidates should take time to check their working carefully to avoid this kind of error. A significant number of candidates were unable to make a correct start at all, failing to the grasp the concept of needing a common denominator and working from there.

Question 13

This question was answered well as candidates were able to gain 3 marks for a correct answer. Of those that didn't, some had a method to reach 673,200 but then divided the difference between the value at the end of second year and third year by 698,445 instead of 673,200. Some candidates reached 1.0375 but gave this as their final answer, gaining 1 mark only. Some candidates were not able to make a correct start at all and gained 0 marks. Many candidates struggled to find the correct multiplier equivalent to a decrease of 6.5%.

Question 14

Both parts of this question were answered well. In (a), those that didn't score 2 marks often scored 1 mark for one or two correct pairs of branches. Some candidates misinterpreted the information in the question and labelled each pair of branches 0.7 and 0.4.

In (b), those that didn't score 2 marks generally scored 0 as they were unable to produce the correct product from their tree diagram. It should be noted by centres that the marks are for "0.3" × "0.6" only e.g. any extra work or products used will lead to 0 marks awarded. There was a follow through in (b)

available for the candidates who did not have correct branches in (a) and this was often seen.

Question 15

Part (a) saw mixed results, some candidates were able to give a correct answer of 9 ($9\sqrt{3}$ was also accepted); 5 was the most common incorrect answer.

Part (b) also saw mixed results and a fully correct response was not seen very often. Some candidates were able to score 2 marks for explicitly multiplying the numerator and denominator by $3+\sqrt{2}$ and then showing correct surds work by expanding the denominator. Many then struggled with the step of manipulating to $9+\sqrt{18}$. Some candidates were unable to make a correct start and candidates going straight to 9 + 3√2, presumably from typing the question directly into their calculator and scored no marks, was seen often.

Question 16

Part (a) was answered well as candidates could score 1 mark for a correct answer.

Part (b) saw mixed results and the range of marks were awarded on a regular basis. Some candidates were able to find a correct composite function, remove the square root and solve the inequality to gain a correct answer. Of those that didn't, 2 marks were often gained, with the error often that the inequality sign was incorrect or an equals sign used. Some candidates managed to gain a correct composite function by substituting g(x) into f(x) but could go no further as they could not deal with the square root. The most common 0 mark solution saw candidates finding gf(x) instead of fg(x).

Question 17

This question saw mixed results and the full range of marks were awarded on a regular basis. Some candidates were able to work with the histogram and they also understood what was meant by proportion to give an answer of $\frac{11}{63}$ or equivalent; it was also common to see any of the equivalent answers highlighted in the mark scheme. Of those that did not score 3 marks, it was clear that it was not understood what was meant by 'proportion' and many gave an answer of 22 without a method to find the total number of people, thus gaining 1 mark. Some candidates scored 0 marks as they did not understand the fact that area of bars represents frequency, instead using the height of the bars for the frequency.

Question 18

This question saw mixed results but some managed to work through the method and gain 4 marks for a correct answer of 0.5 or equivalent. Of those that didn't

gain full marks, some gained 2 marks for substitution of x and y into a correct formula or reaching $k = 108$, and some managed to gain the 3rd mark for a method to find x^3. A significant proportion of the cohort scored 0 marks as they made an incorrect start, usually working with direct proportion or if they did manage to set up an equation using inverse proportion, the denominator was x or x^2 instead of x^3.

Question 19

This question saw mixed results and is an area some of this cohort need to work on. Common incorrect answers were (i) (11, −12) and (ii) (16, −12).

Question 20

This question was answered well considering its stage in the paper, with some candidates scoring the full 5 marks. Of those that didn't, it was common to see 2 marks awarded either for correctly working with the Cosine Rule to reach $BD = 13.3$ or for using the Sine Rule correctly to find BC following through their incorrect value of BD. Some candidates made errors with the Cosine Rule such as failing to square root, inputting the calculation into their calculator incorrectly or not using the correct order of operations. Some candidates assumed triangle ABD was isosceles or right-angled and therefore did not gain the first 2 marks but they could still gain the 3rd and 4th marks for the Sine Rule following through. It should be noted that assumptions should not be made, especially as the diagrams are not accurately drawn.

Question 21

There were a number of methods highlighted in the mark scheme and errors made often included missing the '3 ×' or '6 ×' aspect for the number of combinations meaning only one mark could be awarded. Some also missed products out if they decided to list them all and add. One mark being awarded was often seen as only one correct product was required. Some candidates misinterpreted the question and considered 'with replacement' e.g. when the counter is returned to box after each pick; there was a Special Case B1 in the mark scheme for the candidates who did this method accurately. Some candidates did not know how to start this question and gained 0 marks. Others attempted to draw a tree diagram with 27 branches and then either ran out of space or lost their way in the complex working out involved.

Question 22

This question saw mixed results but some candidates were able gain 5 marks for two correct x values and two correct y values. Of those that didn't, a variety of marks were awarded as the mark scheme allowed for some errors in algebraic simplification and solving of the quadratic equation. One common error was in the initial substitution – if this is not done for the 1st M mark then no marks could then be awarded. Another common error was in the expansion of brackets

once the substitution had taken place, with $(x + 2)^2 = x^2 + 4$ seen often. This could still lead to 4 marks being awarded if when multiplying out and collecting like terms, their three-term quadratic in any form of $ax^2 + bx + c$ (= 0) had at least 2 coefficients (a or b or c) correct.

Question 23

Part (a) was answered well with some candidates able to gain B1 for a correct answer. The common incorrect answer was 12**a** + 8**b**, or not giving an answer at all.

In (b), some candidates were able to gain the first M mark, usually for a correct vector for $\overrightarrow{PR}$, but went no further. There was a follow through available for their $\overrightarrow{AB}$ but this was often not applied, as the most common error in (a) assumed $\overrightarrow{AO}$ was 12**a** and therefore this usually led to an incorrect vector for $\overrightarrow{PR}$ as the candidate would use −6**a** instead of 6**a** for $\overrightarrow{PA}$.

Question 24

This question saw mixed results, although some did manage to work with the equations for U_{20} and S_{30} and go on to gain correct values for *a* and *d*. Of those that didn't, most gained 0 or 1 mark, with 1 mark usually being for a correct equation for S_{30}, presumably as this is given on the formula sheet on page 2 of the exam paper. For most of those who did gain 2 marks for two correct equations, incorrect algebraic simplification let them down and once errors had been made no further marks could be gained.

Question 25

This question saw mixed results. Some candidates were able to pick up 1 or 2 marks for either/or a method to find the midpoint of *PR* or the gradient of *PR*. There was also a follow through available for the candidate who did not have a correct method or value for the gradient of *PR* but did manage to use this correctly to find the perpendicular gradient of *QS*. If they then used this gradient and their midpoint of *PR* (or their coordinates of *Q* or *S*) for the equation for *QS* they could also gain the 4th M mark. Some candidates reached $y = \frac{1}{3}x - 1$ and gave this as their answer. Some candidates attempted to draw the square on a grid they had drawn which usually led to 0 marks.

Summary

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Based on their performance in this paper, candidates should:

- be thoroughly confident with their method and avoid instances where an incorrect method and answer is given on the answer line and a fully correct method and answer is given elsewhere in the workspace.
- practise problems involving interior and exterior angles
- ensure algebraic fractions are fully simplified if asked and ensure that care is taken when transferring expressions from one line of working to the next
- take care with the inequality sign when solving inequalities
- understand what is meant by the term 'proportion' e.g. in Question 17
- interpret the initial information correctly in direct or inverse proportion questions to enable them to set up a correct initial equation
- practise graph transformations
- not make assumptions for geometric diagrams as they are not accurately drawn
- practise conditional probability problems
- ensure squared brackets are expanded correctly e.g. $(x + 2)^2 = x^2 + 4x + 4$ not $x^2 + 4$
- practise vector problems
- practise arithmetic series problems and be familiar with the formula for the nth term
- practise problems involving perpendicular lines

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