Examiners' Report
Principal Examiner Feedback

November 2023

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

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

Those who were well prepared for this paper made a good attempt at all questions. It was good to see several students attempting the grade 4 and 5 questions and gaining a couple of marks for these, even if they could not see the question all the way through. The paper differentiated well.

Overall, working was shown and was followable.
Most of the questions in the paper were accessible to the majority of students. Although some struggled with questions of a problem-solving nature, there was ample opportunity to score well with the significant number of familiar looking questions.

There was a noticeable amount of misreads this examination series with students incorrectly copying numbers from the question. This always led to accuracy marks being lost. Students should be advised to always check what they have written when copying numbers to ensure accuracy.

In general student showed clear stages of calculation.

Algebra skills let some students down.

Report on individual questions

Question 1
This proved to be a good starter question with the vast majority of students scoring all 4 marks. In part (c) the most common incorrect response was "tenths"

Question 2
Nearly all students could correctly work out how many parcels were posted on Tuesday and were able to correctly complete the pictogram for Friday. It was pleasing to see how well the students coped with the given scale. With most students getting part (c) correct too. Some had difficulty using ratios in part (d) with 56:52 or 14:13 being a common incorrect answer which scored 0 marks. Those who were able to write the numbers 56 and 48 often either wrote this as a fraction (scoring 0 marks) or failed to simplify correctly (scoring 1 mark). Others wrote the ratio 56 : 48 but then gave their answer as the fraction $\frac{7}{6}$ (also scoring 1 mark). Some students gave the ratio in reverse as 6:7 gaining only 1 mark. However, over 60% of students did provide the correct answer of 7:6 with other forms of the correct answer rarely seen.

Question 3
Parts (a), (b) and (d) were generally correctly answered. Part (c) proved more challenging. Those students who first wrote each number to 3 decimal places tended to get it correct. Many of those who did

not use this method gave an answer of 0.4, 0.24, 0.48, 0.204, 0.408 as they thought any number with fewer decimal places must be smaller! Another common error was putting 0.408 before the 0.4

Question 4

It was pleasing to see that around 75% of the students could work out the value of x correctly. Most students started by converting 1.7 km and 2 km to metres. Those that got the conversions incorrect tended to use the incorrect conversion of 1 km = 100 metres but were still able to earn a method mark if they added their 3 given lengths and subtracted this from 6250. The most common error, which scored 0 marks, was to not use a conversion and then subtract from 6250.

Question 5

This was well answered by nearly all students, particularly part (ii) where students were required to mark the probability that the counter was yellow at 0. Some students found it helped to write ¼ and ¾ on the grid before marking the probability with a cross (×). The most common error was to mark the probability that the counter was yellow at ¼.

Question 6

Drawing a right-angled triangle on the grid proved no problem for over 90% of the students although some students just drew a right-angle rather than a right-angled triangle. The most common incorrect response was to draw a horizontal line for the base of the triangle and on this draw an isosceles triangle with an attempt to make the angle at the top 90°. These were seldom, if ever correct. Virtually all students could draw a rectangle on the grid but many struggled to ensure it had an area of 20 cm^2. A number of students drew rectangles with a perimeter of 20 cm rather than the correct area. The most common correct response was to draw a 5 cm by 4 cm rectangle but there were many 10 cm by 2 cm rectangles seen. Surprisingly, in part (b), there were quite a few students who drew a triangle, with some having a correct area in order to score 1 mark.

Question 7

Almost all students could write 4.30 pm as a time in the 24-hour clock. Nearly 90% of the students were able to work out at least one of the times needed in part (b), scoring at least one mark. Many students thought the time from Beetown to Corthill was only 55 minutes thereby losing the accuracy mark. Surprisingly there were many students who correctly wrote the time from Corthill to Pilton was 46 minutes but when they tried to find the difference in the times they wrote 65 – 45 (=20)! Others correctly found the two times but then did not subtract to find how much more time, scoring only 1 mark, or instead added the times together. Students should be alerted to the wording in the question that it takes **more** time to get from Beetown to Corthill than from Corthill to Pilton alerting them when they found their time was less. Those students who used decimals to find the difference of 19 minutes, writing 1.05 – 0.86 or 105 – 86, scored no marks.

Question 8

Around 2/3 of students correctly found the value of x. Working out the value of y proved a bit more challenging with 60% providing the correct answer. Most of those who got 55° went on to give one

correct reason for their answer. This had to include the underlined word(s) in the mark scheme to score the mark. Quite a few students stated parallel lines but were unable to then identify a correct reason following that. A common incorrect answer was 32º. Students should show more working on the diagram as this can help gain method marks.

Question 9

Nearly 80% of the students were successful in working out the cost of 1 kg of potatoes. Most of these started by finding the cost of 1 kg of carrots and then subtracting the cost of 3 kg of carrots from 207. A few students used a method of simultaneous equations and then equated the coefficients of *C*. This proved to be a less efficient method, often resulting in errors. Students should remember to use a calculator to check "simple" calculations.

Question 10

Well over 80% of students correctly worked out the value of *y* in part (a). Those that got the answer incorrect tended to score 0 marks. Students were less successful in writing down an expression in terms of *x* for the output in the second number machine with only ¼ of students scoring both marks. The most common incorrect response, scoring 1 mark, was $x + 7 \div 5$ with many others scoring a mark for $x + \frac{7}{5}$. Some students felt their answer ought to be an equation and it was not unusual to see $x =$ or $y =$ before their expression.

Question 11

Nearly 90% of students were able to accurately use the graph to convert 35 Australian dollars to euros and to convert 20 euros to Australian dollars. But many students found it more challenging to change 500 Australian dollars to euros. Those students who used the graph to convert 1 Australian dollar to euros (or even 1 euro to Australian dollars) tended to get an answer outside the required range.

Question 12

Around 70% of students could expand the brackets correctly in part (a) with around 55% of students factorising correctly in part (b). Part (c) proved far more challenging with over 70% of students scoring no marks. Many students just wrote an answer without any intermediate steps and generally scored 0 marks. Those that scored 1 mark tended to miss out $e =$ or write $e = y + f \div h$. Many students incorrectly just switched the *e* and *y* giving $e = yh - f$. Most students were able to score both marks for writing down the 3 correct possible values. However, many students thought the numbers had to be between 7 and 10 exclusive, scoring 1 mark for an answer of 8 and 9. Sadly, nearly a third of students were unable to score even 1 mark.

Question 13

Most students were able to score at least 2 marks working out 10% of 150 and finding there were 135 shirts being sold. Often they then went on to do $360 \div 135$ which was an incorrect follow on to work out the value of *g*. Alternatively, they did not understand the concept of profit, so instead of adding 360 to 1800, they subtracted to get 1440. They then continued and divided 1440 by 135. Many students found the cost

of each shirt (1800 ÷ 150 = \$12) but then got stuck. Those that recognised they needed to sum 1800 and 360 to get 2160 often went on to get the correct value for g.

Question 14

Over 80% of students correctly worked out the value of the fraction, writing their answer to at least 6 significant figures. Some students lost a mark for writing their answer to 3, 4 or 5 significant figures whilst a few did not score as they gave their answer as 9.4 Students are to be encouraged to write answers found on their calculators in full before rounding. There were also quite a few students who left their answer as $\frac{35.74}{3.81}$ thereby not accessing the final mark.

Question 15

Students were asked to work out whether the small bag of fudge was better value for money than the large bag of fudge and were told to show their working clearly. This question was attempted by nearly all students and they all showed some working. There were many ways to work this out with the most popular methods being to compare how many grams per pound you got for each size bag or the cost per gram for each size bag. A common incorrect response after calculating 80 and 83.3… was to then say the large bag was better value for money as 83.3… was a larger value than 80. Quite a few students found the value of 450g of the small bag of fudge and then subtracted the cost from cost of large bag, and stated that the extra 50g cost showed the small bag was cheaper. This was not acceptable as they were not comparing equivalent costs per 450g.

Question 16

There was a number of ways students could work out the least possible height of the crate. The most popular method was how many boxes could fit into the bottom layer of the crate with many students finding they could fit 6 along one side and 2 on the other side. Some then went on to say there they could fit 12 boxes on the bottom layer. Few managed to make any further progress. A number of students incorrectly used 20 + 20 + 20 as the volume of the box, gaining no marks. Over 60% of the students failed to score any marks on this question. A disappointing number of responses showed the volume of the box incorrectly calculated as 20 x 3 = 60. A common mistake was to divide 8000 by 48, rather than multiply. There were several responses where students added the values for each shape, rather than multiplying.

Question 17

About half the students were able to write down the modal class interval and were able to score at least 1 mark for estimating the total length of the telephone calls. A number of students wrote 18 for the modal class, rather than stating the corresponding class. By far the most common error was to then go on to find the mean which resulted in a large number of students losing the final mark. Students tended to be inconsistent with the way they determined the mid value of the class intervals with 2.5, 8, 12 or 13, 17 or 18 etc used. Others simply added their mid values to get their answer, showing no understanding of what was required.

Question 18

It was common to see Pythagoras used to find lengths. However, many students attempted to find the length of *BC* by summing the squares of 8 and 10 rather than calculating $10^2 - 8^2$. They could go on to score the final method mark if they added 5 to their answer before calculating the value of *w*, resulting in $w = 22.6$ Others recognised that they needed to find the length of *DE* using Pythagoras but then used 5 and 14 as the lengths of *CE* and *CD*. Around 30% of students scored all 4 marks with around 60% failing to score any marks.

Question 19

In part (a) students struggled to reflect the shape in the line $y = x$ with many reflecting the shape in the line $y = 4$ or $x = 4$. Some students scored a mark for drawing the line $y = x$ on the grid but then were unable to use this to do the correct reflection. In part (b), Some students recognised the shape was enlarged but did not know the mathematical word 'enlargement' whilst others wrote that triangle **A** was enlarged but then went on to say that the shape had moved downwards or some other way of describing a translation which meant they could not access the mark for the single transformation needed. Many recognised that the shape was enlarged by a scale factor of 3, scoring a mark but few provided the coordinates of the centre of enlargement.

Question 20

Over 75% of the students could not access any of the marks for part (a). The first mark was awarded for either multiplying $2x - 5$ by 6 correctly by either writing $12x - 30$ or $6(2x - 5)$ or equivalent. However, many students wrote $2x - 5 \times 6 = 2x - 30$ which meant they could not access the first mark. If they then went on to attempt to isolate their terms in *x* on one side and the number terms on the other side, they could go on to score a mark but this was generally done incorrectly. A handful of students arrived at the correct answer of 3.5 without showing any working. The question clearly stated that they should show algebraic working, so these responses failed to score any marks. Simplifying $h^{15} \div h^3$ correctly was much more successful. simplifying $(2g^3k^5)^4$

Provided a challenge to most students with over 60% failing to score. The most common incorrect answer was $8\,g^{12}k^{20}$ scoring 1 mark. In part (d) the most successful method was forming a calculation using the indices and getting $12 + 7 - 5 = 14$ Students must be careful when writing an embedded solution that they write the correct value on the answer line. Sight of $5 + 14 - 7 = 12$ with 12 on the answer line was not uncommon. In this part of the question, students mainly scored 2 marks, or zero. Method marks alone were rarely awarded, mainly due to students just working with the values of the indices, rather than with powers of y.

Question 21

Many students scored just 1 mark for finding the value of one share by writing $120 \div 2 = 60$ but then failed to score any further as they could not find a correct expression or equation to work out the weight of the flour Avril used. A number of students incorrectly used the 60 and multiplied by 6 to get the weight of flour as 360g. However, ¼ of the students were successful in reaching an answer of 216 grams.

Question 22

Students are getting much better at showing all the steps needed for this type of fractions proof. The vast majority of students scored at least one mark for expressing both mixed numbers as improper fractions. The most common method was to invert the 2nd fraction and showing intention to multiply. However, many then wrote $\frac{72}{56}$ and went straight to $1\frac{2}{7}$ omitting the required intermediate step of $\frac{9}{7}$ thereby not gaining the final mark. It was pleasing to note that hardly any students used decimals in their attempt to show the fraction calculation.

Question 23

Students are getting more familiar with this type of question with fewer than 30% of students failing to score. Most understood that the value depreciated and it was not uncommon to see 26800×0.8 with students not understanding how to convert 8% to a decimal. Others wrote 26800×0.08^3 (= 13.72), clearly not understanding what was required. The most common incorrect answer was £20368 from first working out 8% of 26800 and then using a simple interest calculation. The most successful attempts were from those who used 26800×0.92^3
to reach their answer.

Question 24

Students were provided with the mean number of goals scored in 8 hockey matches and the mean number of goals scored in 10 hockey matches. Those students who recognised they first needed to find out the total number of goals scored in 8 matches and 10 matches tended to go on to work out 70 – 48 = 22 but often this was given as the answer rather than dividing 22 by 2 to get the correct answer of 11.

Question 25

Most students attempted this question but failed to recognise that the *y*-intercept was given by the coordinates (0, −3) and that a calculation for the gradient was required. The most common incorrect response was $x = 2$, $y = -3$, just writing down the values of x and y from the given coordinates. Others recognised that the equation corresponded to $y = mx + c$ and then wrote $y = 2x - 3$, scoring 1 mark. It was not uncommon to for students to state the gradient was negative (from the −3 and 2 given in the coordinates). A diagram showing a straight line going through (0, −3) and (2, 0) was frequently seen.

Question 26

There were many ways the students could work out the value of x with many able to work out one of the missing lengths on the diagram, scoring the first mark. However, many of those who showed the calculation 25 – 7 – 8 = 10 then wrote 10 on the diagram for *DE* instead of using or showing it as a vertical length from *D*. Most of the marks earned in this question for working out one of the lengths and/or correctly writing down an expression for one or two correct areas of any of the parts of the diagram that did not overlap with $8(x + 2)$ and $7(x + 6)$ or $25(x + 6)$ seen the most. Around ¾ of the students failed to score. Amongst the most common failed attempts were those candidates who summed the given sides as if working with the perimeter. Some students realised that by finding the area of the rectangle and triangle on the right (total 48), meant they could subtract the sum from 258 and then divide

by 25 to get the value for $x + 2$. The majority then realised they could just subtract 2 to get the answer, thus simplifying the question as no expansion of brackets was required.

Summary

Based on their performance in this paper, students should:

- read questions very carefully and even when they think they have the answer, check they are giving what was requested
- have more exposure to area problem solving questions
- improve their basic algebra knowledge
- be encouraged to make an attempt at a question rather than leaving it blank
- not cross out work unless they are replacing it with something better
- check if answers are realistic
- check any rounding instructions
- show clear easy to follow working laid out from top to bottom and from left to right rather than randomly around the working space
- be particularly careful with accuracy when copying numbers given in the question
- have a better understanding of the difference between area and perimeter
- students needing to be more familiar with key wording such as ‘Find the ratio’ (question 2d), ‘Write down an expression, in terms of x’ (question 10b) and 'Make the subject of' (question 12c)
- Make more use of diagrams to help understanding, such as in geometry questions as it would help to put working on the diagram. In question 26, it proved helpful to split the diagram up and put working out on it. The students who gained full marks usually did.

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