Examiners' Report
Principal Examiner Feedback

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

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It was pleasing to see this cohort attempt the majority of questions in what is the final 2FR paper in the January session, since 4MA1 will move to a June/November cycle from this year.

Working was present for almost all questions that required a method and this certainly helped students gain more marks. It was also pleasing to see students adhere to the instructions in the question to ensure they were credited for correct methods and answers, particularly when working was asked for. Up until the final few questions, most responses saw an attempt and further question-by-question detail can be seen below.

1   Part (a) was answered well with most students able to order the five integers from smallest to biggest. Part (b) also saw the majority gain B1 for a correct answer of 5102. Part (c) saw more mixed results with incorrect answers seen including tenths, hundreds and rounding 7439 to varying degrees of accuracy e.g. nearest ten. Part (d) saw the majority able to give an answer of 700 for B1 but some rounded to the nearest ten or down to 600.

2   Part (a) was answered very well with almost all students able to gain B1 for reading the value 40 from the bar for Germany. The same can be said about part (b) as USA was given as an answer by most students. In part (c) not all students gave the correct answer of 95; the most common error was in reading the frequency for Saudi Arabia with 10 being seen instead of 5. Part (d) was answered very well with almost all students drawing a correct bar; of those that didn't the most common error was to draw a bar at 22.5.

3   Part (a) of this geometry question saw mixed results. Three quarters of this cohort gave a correct answer of Octagon but there were also plenty of incorrect answers with Hexagon being the most commonly seen. Part (b) also saw some incorrect answers such as right angle and obtuse, although a good number of students were also still able to give the correct answer. For part (c) more than half of students managed to draw a correct chord and gain 1 mark. Common incorrect answers were drawing a tangent or radius. Part (d) was generally answered well although incorrect answers 36 and 3600 were seen often.

4   Part (a) was answered well with most able give the correct answer; those that didn't generally gave the coordinates the wrong way round. Part (b) provided no issues for most students with the majority picking up one mark; those that didn't plot the correct coordinate generally plotted $(-2, 3)$. Part (c) saw mixed results with around two thirds of students gaining 2 marks for the correct answer of $(-3, -1)$. Of those that didn't, common incorrect answers were $(-1, -3)$ or one correct coordinate. Part (d) was answered well with a good number able to give the correct answer; common errors were to confuse x and y and give an answer of $x = 3$.

5   This 4-mark problem solving question saw the full range of marks awarded. In general, it was answered well and three quarters of students were able to interpret the information correctly and reach a correct answer of 550. Of those that didn't, many gained 2 marks with the most common error being to work out the weight of **B** as 350 instead of 750 but still converting a weight correctly and working out the weight of **C** as 800 g. Some students gained one mark only for the weight of **B** or **C** and some students did not convert any weights or used an incorrect conversion such as 1 kg = 100 g.

6   Part (a) was answered well with most students picking up 1 mark on both (i) and (ii). Some students gave an answer of $6n - 2$ for (i), not reading or understanding the demand properly. Part (b) also saw plenty of success with the majority of successful answers choosing to continue the sequence, although some did use the nth term. Part (c) saw mixed results with around half of students not able to give a correct explanation. The common incorrect answers were to say that 467 was not divisible by 6 and that 466 was in the sequence without giving 472 as well as per the mark scheme.

7   Part (a) saw most students gain at least one mark for writing 60 : 24 or a ratio equivalent to 60 : 24. Around two thirds of students went on to give their ratio in its simplest form but some stopped at, for example, 15 : 6. Some students scored no marks as they worked with fractions instead of ratio. Part (b) was answered well with the majority of students able to give the correct answer. The most common incorrect answer seen was 3/7. Part (c) caused problems for this cohort with only around half gaining 3 marks for the correct answer. Some managed to gain 1 mark for reaching an answer of 55 and many gained 0 marks as they treated 20 as the total number of hay bales.

8   This question was answered well with most students giving all 12 possible combinations with no incorrect or repeat combinations. It was pleasing to see almost all those who did gain full marks order their combinations in a systematic way and use the efficient letter notation. Of those who didn't get the correct answer, most scored 0 as they failed to interpret the meaning of the demand or gave an answer of 12 (the number of combinations).

9   Part (a) was generally answered well with most giving the correct answer of 20 30. Sloppy notation was condoned e.g. 20.30. Incorrect answers seen included 08 30, 18 30 and 19 30. Part (b) saw varied results with the full range of marks awarded. Around half of students managed to work with time correctly and reach an answer of 95 minutes. Of those that didn't, some gained 2 marks for either an answer of 1 hour 35 minutes or reaching a time of 12:45pm and not being able to work out the time difference between 12:45pm and 2:20pm. Some students gained 1 mark, usually for adding 45 minutes and 1 hour 10 minutes or for working with times, either adding a time correctly onto 10:50am or if the first calculation was done incorrectly, e.g. 10:50am + 45 minutes = 11:40am but then correctly doing 11:40am + 1 hour 10 minutes = 12:50pm and therefore gaining M0M1A0.

10 Part (a) of this currency conversion question was answered well with most students able to gain 2 marks for an answer of 590. Of those that didn't, many scored 0 marks as they divided by 1.18 instead of multiplying. A small number of students misread

1.18 as 1.8, still gaining M1 for 500×1.8. Part (b) was also answered well but there was a larger proportion than in part (a) that scored 0 marks for multiplying instead of dividing by 1.40.

11 This 4-mark problem solving fractions question saw the full range of marks awarded. Around half were able to interpret the information correctly and give a correct answer of 27/200 for 4 marks. Of those that didn't gain full marks, some gained 3 marks for reaching 27. Some students gained 2 marks for finding the beads given to Bernadette and the beads given to Claudio. Others misinterpreted the information given in the question and after reducing the 200 beads by $\frac{1}{4}$ then worked out $\frac{2}{5}$ of 150 instead of 200, gaining only one mark.

12 It was rare to see a fully correct answer for part (a). Many students misinterpreted the information in the question and labelled the only dog section as 13; these students often gained one mark for labelling cat only as 11 and the intersection as 5. Despite the lack of correct answers in (a) many were able to gain follow through marks in part (b) by correctly interpreting their Venn diagram. Common incorrect answers in (b) included giving answers as integers e.g., 13 and 6 or as ratios.

13 This problem solving 5-mark question saw the full range of marks awarded. Some students were able to work out the correct area of 117, divide by 7, interpret 16.7... as meaning 17 tins were needed and multiplying 17 by 23.90 to get the correct answer. A proportion of the cohort scored 3 marks as they reached as far as 117 / 7 = 16.7... but then multiplied 23.90 by 16.7... or 16, losing the final two marks. A large number of students were unable to use a correct method for the area, finding the sum of 8×12 and 3×15 was commonly seen but students could still gain the 3rd and 4th M marks if they divided their area by 7 and rounded up to the nearest integer and multiplied by 23.90. In fact, even if the method for area was completely wrong e.g. finding the perimeter, the 3rd and 4th mark could still be gained as long as at least two of the given dimensions had been used, and this was seen often.

14 Part (a) was answered well with almost three quarters of students able to expand correctly to gain 1 mark. Common incorrect answers were $10 - x^2$ and $10x^2$. Part (b) saw some success but it is clear that this cohort need to work on factorising; it was usual to see incorrect answers such as $6(y + 27)$ and $33y$ as often as the correct answer. It was rare to see a fully correct answer in part (c). Many students struggled to deal with the denominator of 2 but a good number were able to pick up one mark by subtracting 4 from both sides. A common incorrect answer was $m = 2h - 4$ where the student had correctly subtracted by 4 but only multiplied h by 2. The most common 0-mark answer was to simply swap m and h in the original formula. It was pleasing to see a decent proportion of this cohort show a full algebraic method and correct answer to gain 3 marks on part (d). Of those that didn't, some gained 1 mark for a partially correct method, usually for correctly collecting the terms in g on one side. Many struggled with the numerical terms in particular working out $-5 - 3$. A very small number of students gave a correct answer with no method shown, being awarded no marks as clear algebraic working was asked for.

15 The full range of marks were awarded on a regular basis on this dividing fractions question. For those who were able to gain 3 marks, all the methods from the mark

scheme were seen, with many students converting $2\frac{6}{11}$ to $\frac{28}{11}$ and showing the left-hand side reaching $\frac{28}{11}$. Of those that gained 2 marks, the most common error was to skip a step e.g. $\frac{14}{3} \times \frac{6}{11} = \frac{28}{11}$. Some gained 1 mark for the correct improper fractions but failed to make any further progress.

16 A small number of students were able to correctly rotate triangle A for 2 marks. Of those that didn't, some drew a correct shape with correct orientation but incorrect position for one mark. Part (b) saw mixed results with some students able to translate triangle A to the correct position but many could not, with shape C seen in all four quadrants of the grid as well as off the grid altogether.

17 It was rare to see a fully correct answer for part (a). A small number did manage to give the 5 correct values and no incorrect but of those that didn't, some gained one mark for 4 correct values, commonly omitting 0, and no incorrect values or for all 5 correct values with no more than one incorrect, often including −4 or 2. Of the many answers worth 0 marks the most commonly seen was to list the integers from −7 to 2 or to divide the inequality by 2 and give this as the answer. In part (b) the majority of students scored 0 marks, with $-1 < x < 5$ being the most common incorrect answer.

18 Very few students scored 2 marks on this constructions question, it is clear that the majority of this cohort had simply not worked on this topic. Some students managed to gain one mark for an angle bisector within the guidelines but with incorrect or insufficient arcs.

19 A small proportion of this cohort were able to interpret the equation correctly and draw a correct linear graph. For those that did gain 3 marks, some generated coordinates by substituting x-values into the equation to gain y-values whereas others produced a table. Some students were limited to 2 marks as they plotted all the correct points but did not join them with a line or made an error on one or some of the points. A large proportion were unable to work correctly with the equation and produced a linear graph with a positive gradient.

20 This probability and algebra question saw little success for this cohort. The majority were unable to make a correct start and set up and equation to find x using the information that $x + 7 = \frac{1}{4} \times 80$. Of those that did manage to reach $x = 13$, many then used the number of red counters as 13 instead of 20 when working out the number of yellow counters.

21 For part (a), around half of this cohort were able to score 2 marks for a correct answer of 20 or $2^2 \times 5$ (or equivalent). Of those that didn't gain 2 marks, a good number scored 1 mark for either correct prime factors for 200 or 420 or at least two factors of both. The most common incorrect answer seen was to find the Lowest Common Multiple. Part (b) saw less success with few students able to achieve 2 marks for a correct answer. Some students picked up one mark for the omission of one term with the others fully correct or a fully correct Venn diagram. The modal score was 0 with the most common incorrect answer being to multiply all 3 terms A, B and C.

22 The majority of students scored 0 marks on this question. The most common incorrect method seen was to find the mean of the two means given in the question, 52 and 55. Of those did realise that the first step was to find the total mark for Class A and total mark for Class B, the majority went on to gain a correct answer of 53.6. It should be noted that students should not prematurely round their answers, a small number of students gave 54 as their answer and this was not accepted unless preceded by 53.6.

23 In this two-part percentages question part (a) saw more success than part (b). Some students were able to use a correct method to gain a correct answer in range. Both the efficient method and the year-by-year method were seen. Some students had rounded incorrectly but fortunately written down the unrounded value so still gained full marks. Of those that didn't score 3, some gained one mark for working with simple interest, usually either for working out 4% or 104% or 12% or 112% of 2000. Many students used the percentage button on their calculators e.g., $2000 \times (1 + 4\%)^3$; it should be noted that without the correct answer this method gains 0 marks. In part (b) it was rare to see a fully correct solution with treating the initial percentage change as an increase and doing e.g., $1365 \div 1.09$ being the most common incorrect method seen.

24 The full range of marks were awarded for this density/mass/volume question. Some students interpreted the information correctly and worked out the volume of A, combined the two masses and volumes for C and correctly found the density for C for 3 marks. Of those that didn't, many gained 2 marks for finding the volume of A and then the density of either A and/or B; a common error was to find the sum of the densities of A and B and give this as their answer. Some students gained 1 mark, either for the volume of A or use of density. At this stage of the paper it would be expected to see some blank responses and this was certainly the case.

25 The final question on this foundation paper proved a challenge for this cohort with very few scoring full marks. A good number did achieve 1 or 2 marks for finding a relevant angle, generally seen on the diagram, and then going on to work out the interior or exterior angle. It should be noted that students should always attribute working to an angle e.g. using 3-letter notation or labelling on the diagram. Many showed a calculation using the numbers given e.g. $180 - 128 = 52$ but gained no marks as this was not attributed to an angle.

Summary

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Based on their performance in this paper, students should:

- Practise completing Venn diagrams based on information given.

- Practise changing the subject of a formula, in particular ones involving fractions.

- Work on transforming shapes, in particular rotating and translating.

- Practise compass and ruler constructions.

- Practise combined mean problems.

- Practise reverse percentages.

- Always attribute working to an angle e.g. using 3-letter notation or labelling on the diagram.