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Examiners' Report
Principal Examiner Feedback

November 2020

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

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November 2020

Publications Code 4MA1_1FR_2011_ER

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International GCSE Mathematics

4MA1 1FR Principal Examiner's Report

It felt rather unusual for a 4MA1 exam session to be sat in November and this did not feel like the usual cohort sitting this paper. All questions were attempted well and right through to the last question there were a good proportion of students gaining full marks; it is often the case that the final few questions see many blank or incorrect responses but this was not the case.

Topics new to 4MA1 are now well answered, question 25 being an example of this. It is pleasing to see students have a good go at longer mark questions; even if the correct answer was not gained partial solutions were picking up marks. Some topics continue to cause problems with incorrect methods seen, examples being time problems (question 23) and reverse percentages (question 21b).

- 1 Part (a) was answered well with almost all students shading the required 3 squares – some shaded 1 or 15 squares. Part (b) also saw plenty of success for this cohort; commonly seen incorrect answers were 3.8 and 24. Finding the proportion of the class who do not walk to school was also a success as almost all scored 1 mark on part (c). In part (d) a variety of correct answers were seen, with $\frac{14}{18}$ being the most commonly seen. Most students were also able to convert a decimal to a fraction in part (e).
- 2 Students were able to use the key correctly in this pictograms question as most gained 1 mark for an answer of 40 in part (a). Most students were able to read the values for June and May and find the difference for an answer of 36 in part (b). Part (c) was also answered well with almost all able to show the information for July correctly on the pictogram.
- 3 Clearly these students know what congruent shapes are as almost all scored 1 mark on part (a). The only occasional incorrect answer seen was **B** and **E**. Part (b) was poorly answered with many students drawing shapes congruent to **B**. Some did attempt an enlargement but most could not correctly enlarge each side length. Of those that did gain 2 marks, a scale factor of 2 was used. Part (c) saw many gain 1 mark for a correct answer of hexagon, incorrect spelling was condoned if the meaning was ambiguous.
- 4 Part (a) saw mixed results as 'likely' was circled as often as 'evens'. In the first of 3 probability scale questions, students fared well on part (b), picking up 1 mark for a cross at 0. Part (c) also saw some success as many students were able to place a cross at $\frac{1}{3}$. Sadly, many were unable to interpret the meaning of 'or' and therefore could not place a cross at $\frac{2}{3}$; a cross at $\frac{1}{2}$ was a commonly seen incorrect answer.

- 5 Parts (a) and (b) of this algebra question were answered well with almost all gaining the correct answers. In part (a) the most common incorrect answer seen was $5w$ with students mistaking the minus sign for a plus. Part (c) saw more varied results with the standard common incorrect answer of $5f$ being seen several times. It was pleasing to see most students gain 2 marks in part (d) for a correct simplification. In part (e) most were able to factorise correctly, there were a small number of students who achieved the correct answer but went on to do some further incorrect algebra, such as $5(2d + 3) = 25d$, gaining B0. Part (f) saw varied success, for those who were able to successfully isolate the $7t$ term, 2 marks were generally gained. Some attempted to divide through by 7 but this rarely led to the correct answer.
- 6 It was pleasing to see a high proportion of this cohort score full marks on this familiar change problem. Of those that scored 3 marks, most divided 30 by 3.05 although some did repeatedly add 3.05 until they reached 30. Of those that didn't score full marks, some gained 1 mark for $30 \div 3.05$ but were unable to go further in their solution.
- 7 Part (a) was very well answered with almost all students picking up 2 marks. For those that didn't, leaving their method incomplete was their main issue ie failing to divide by 3 after subtracting. Part (b) saw mixed results with a similar number picking up 0 or 2 marks. There were a small number of students who gained 1 mark, usually for finding the correct value of 1.35 but then multiplying by 3 for their final answer.
- 8 Part (a) was answered very well with almost all students able to gain 3 marks for a correct table. Once again working was very rarely seen. In stark contrast part (b) was very poorly seen with correct answers rarely seen, the most common incorrect answers were $\frac{15}{150}$ and $\frac{43}{150}$.
- 9 This question saw mixed results. There were a good number of students who were able to gain 3 marks for an answer of 1800. Of those that didn't, some picked up 1 mark for finding the number of cartons that fit along each edge of the box. There were many who gained 0 marks, with the most common incorrect method being to add the lengths of the edges together and divide the totals.
- 10 This 4 mark problem solving mensuration question saw the full range of marks awarded. There were many who were able to show a full method with a correct answer to gain 4 marks – the A mark was dependent on at least 2 method marks so working needed to be shown as per the instruction in the question. Some were able to get as far as the longest side of the triangle being 9 cm in length but then calculated the perimeter incorrectly by including all 4 sides of the square. Some were able to find the perimeter of the square but then failed to progress any further, gaining 1 mark.
- 11 It was pleasing to see a good number of this cohort scoring full marks on this familiar straight line graph question. For those who did gain full marks, a table was drawn and coordinates calculated before plotting the points. There

were some who gained 1 mark for plotting some correct points and some gained 2 marks for plotting all the points but not drawing a line. There were also a good number who gained 0 marks, failing to use the equation at all to help them.

- 12 This Venn diagram question caused problems for many of this cohort. It was pleasing to see a good number gain at least 2 marks for filling in the sections with the circles and the intersection, and some also managed to fill in the outside section correctly too. There were several students who left the outside section blank, or filled in the correct values 1, 5, 7, 11, 13 plus repeating other values already labelled elsewhere in the diagram. There were also a good number of students who could not complete any sections correctly and therefore gained no marks.
- 13 This question was answered very well with almost all students gaining the full 3 marks for 144 and 150 and a correct decision. There were some who were unable to deal with the percentage but could do $\frac{2}{5} \times 375$ to gain 1 mark. A small number of students were unable to deal with either calculation and simply guessed one of the choices, gaining 0 marks.
- 14 It was pleasing to see a good number of this cohort gaining 2 marks for a correct answer of 140 on this LCM question. Interestingly, most used the prime factors method, with very few listing the multiples of 20 and 35. Of those that did not gain 2 marks, many were able to gain 1 mark for the correct prime factors of 20 and 35, but then not go on to use them correctly to find the LCM. Some students confused LCM with HCF and gave an answer of 5.
- 15 The modal scores for this question were 0 and 2. For those that gained 2 marks, a correct method and an answer of 707 were obtained. Of those that gained 0 marks, the most common mistake was to find the circumference rather than the area of the circle.
- 16 Part (a) of this conversion graph question saw many students picking up B1 for a correct reading of 47. In part (b) many students made good use of their conversion from part (a) by multiplying 47 by 2 to deduce that the cost in the UAE was 94 euros and therefore France is cheaper. Some converted the French price to dirham and again gained 2 marks if done correctly. Some students did a correct conversion but made an incorrect decision. Others only gained 1 mark as they used an inaccurate reading e.g. 1 euro = 5 dirham and this led to an inaccurate conversion but could still gain M1.
- 17 It was pleasing to see a good number of this cohort gain 3 marks for a fully correct and complete solution. Of those that did gain full marks, many 'met in the middle' with their method, e.g. got the left hand side as far as $\frac{35}{12}$ and

also showed that $2\frac{11}{12} = \frac{35}{12}$. There were many students who gained only 1 mark as they started with $\frac{15}{4}$ but then jumped to $\frac{35}{12}$ without showing $\frac{105}{36}$.

- 18 It was rare to see a fully correct angle bisector with arcs to gain 2 marks here. A good number of students were able to draw a bisector in the tolerance allowed but many did not back these up with correct compass arcs. There were many who gained 0 marks having not known how to make a start on this familiar constructions method.
- 19 Part (a) of this algebra question saw a range of correct and incorrect answers. Common incorrect answers seen were h^5 and h^{14} . In part (b) it was pleasing to see a large proportion of the cohort deal with order of operations correctly to gain an answer of 45 and therefore 2 marks. The most common incorrect answer was -5 where the student did not deal with c^2 correctly, usually omitting the brackets around the -5 . In (c) all the students who gained an answer of -5 showed their clear algebraic working as requested and therefore were awarded full marks. Some were awarded 1 mark for correctly removing the denominator but then progressed no further as they failed to deal with the expanding of the bracket correctly.
- 20 It was pleasing to see a good proportion of students gain full marks on this question. Many were able to make a correct start using the mid interval values, finding products, summing and then dividing by 60 to get a correct answer in range. Of those that did not gain full marks, some picked up 2 for using a different value consistent within the interval, usually the upper limit. A good number of students gained 0 marks, having failed to consider products at all.
- 21 In part (a) of this two part percentages question, students were required to calculate a percentage increase; many were able to do this successfully and give an answer of 10.2. The most popular method was to find the difference (765), divide by 7500 and finally multiply by 100. Of those who did not get the correct answer, many picked up 1 mark for either finding 765 or for dividing 8265 by 7500. The only marks awarded on part (b) were 0 or 3. The most common incorrect method was to find 130% of 31.50.
- 22 It was pleasing to see some students picking up 2 marks at the business end of the paper. Of those that did not gain 2 marks, some were able to gain 1 mark, usually for a correct method to find a . The most common error for these students was to use a similar method for b , e.g. treating b as the midpoint of 11 and -19 .
- 23 There was the full range of marks awarded on this 4 mark question. Some were able to correctly convert the time into just hours or just minutes and use it in a complete method to obtain an answer of 81. As is the norm on time questions, there were a good proportion of students who converted the time incorrectly, often as 2.42 hours; these students could still gain the two

method marks and many did. Some were able to convert the time correctly but went no further as they used the speed, distance, time formula incorrectly.

- 24 Compound interest often causes problems on a foundation paper and this was no exception. There were, however, some students who were able to go on to gain all 3 marks for a correct answer in range. Of those that did not gain full marks, some were able to pick up 1 mark, usually for finding 8% or 108% of 1200. Their error generally was to then consider the interest as simple rather than compound and no further marks could be gained.
- 25 It is pleasing to see that this topic, which was new to this specification, is now well answered and a good number of students were able to access it and gain full marks. Of those that did not gain 3 marks for an answer of 78.3, some did pick up 1 mark for correctly finding the area of the square. There were a good number of students who did not find the area of the square and simply worked with 1.5, gaining no marks.
- 26 Again it was pleasing to see students gaining full marks on what is a grade 5 problem solving question. Methods were clearly shown and those that achieved £152.40 as their final answer had worked methodically through all the stages. 2 and 3 marks were also awarded as some students were able to correctly work out the number of a variety of cakes; to gain the third mark the profit for lemon or fruit needed to be found. There were a good number who were not able to make a correct start, some simply played with the numbers given in the question in the hope of picking up a mark or two.
- 27 This was another question which saw a good proportion of this cohort gain full marks. Most found the size of one interior angle, used angles in a triangle and then took 22.5 from 135 to give an answer of 112.5. Of those that did not gain full marks, some gained 1 mark for working out the size of the interior or exterior angle of a regular octagon.

Summary

Based on their performance in this paper, students should:

- ensure they understand there are 60 minutes in an hour, not 100, and use this fact to convert times from hours and minutes to just hours.
- practise drawing similar shapes.
- be able to extract information including probabilities from two way tables.
- practise completing Venn diagrams based on information given.
- learn how to use a compass for constructions such as angle bisectors.
- work on how to find (and spot) a reverse percentage.
- practise compound interest, in particular the most efficient method using a multiplier.

