Examiners' Report
Principal Examiner Feedback

January 2018

Pearson Edexcel International GCSE
In Mathematics A (4MA0) Paper 2FR

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Principal Examiner's Report International GCSE Mathematics A (Paper 4MA0-2FR)

Introduction to Paper 2FR

The paper was in line with previous papers with more straightforward questions at the beginning. Most questions seemed accessible to students at this tier but, as expected, those towards the end of the paper proved more challenging.

Report on Individual Questions

Question 1

The vast majority of students answered parts (a) and (b) correctly. Most were able to show the number of rugby balls sold on Friday in part (c), although some drew $1\frac{1}{2}$ rugby balls while others drew $14\frac{1}{2}$ balls. Some students scored one mark for showing 18 + 12 or 30 in the working space even if they went on to answer the question incorrectly.

Question 2

Most students were able to write down a prime number in part (a), although other odd numbers were sometimes given as answers. In part (b), it was quite common to see answers of 24 or 48 or both, although occasionally multiples of 8 but not 12 or multiples of 12 but not 8 were given. A small number of students confused multiples with factors. In part (c) (i), the overwhelming majority were able to identify an even number. Likewise, (c) (ii) was answered well, although fewer were able to write down the cube number in (c) (iii).

Question 3

Students were usually able to identify the isosceles triangle in part (a) (i), although some confused it with an equilateral triangle and others simply wrote triangle on the answer line. Part (b) was answered less well with many appearing not to understand the meaning of rotational symmetry. In part (c) (i), most students recognised shape **C** as an octagon although some confused it with a hexagon. Similarly, part (c) (ii) was correctly answered by most, although some didn't seem to appreciate the octagon had sides of length 2 cm and so this led to an answer of 8 cm.

Question 4

Part (a) posed very few problems. Likewise, part (b) was answered well by most, although some students weren't able to evaluate −32 + 15 correctly; −47 being seen occasionally. In part (c), the order of operations was usually successfully reversed although a small number of students divided before subtracting. Parts (d) and (e) were more challenging, particularly (e). Those who were able to make a start were usually successful in (d) but in (e) it was not uncommon to see responses such as $y - 15 \div 4$ or $y \div 15 - 4$.

Question 5

Most students were able to write down the coordinates of the point B in part (a), although some wrote them the wrong way round. Likewise in part (b), students generally identified the midpoint of the line AB. Those who chose to calculate it using coordinates sometimes subtracted them and divided by two rather than adding.

Question 6

Parts (a) and (b) were both answered correctly by most students. Part (c) was also answered well, although a number of different fractions equivalent to $\frac{6}{18}$ were given. The overwhelming majority were able to find the percentage of the Earth's surface not covered in water in part (d) and most were able to write 4.54 correct to one decimal place in (e).

Question 7

In parts (a) (i) and (ii), most students were able to write a sensible unit for the length of a car and the weight of a calculator respectively, although errors included centimetres instead of metres and kilograms instead of grams. Writing 3 12 pm as a time using the 24-hour clock in (b) (i) proved challenging to only a few; in such cases 3 12 was a typical error. Many students seemed to attempt part (b) (ii) without an obvious structure to their method. However, one approach was to add 3 12 to 2 55 and then convert 5 67 to 6 07 pm while another was to add 3 hours and then subtract 5 minutes.

Question 8

In part (a), ordering the numbers in order of size was problematic to only a few students; in such cases the main error was to write 0.203 after 0.28 and 0.51. Likewise in parts (b) and (c), there were only a small number of errors but these included 0.07 being written as a fraction in (b). Most students knew the relationship between metres and centimetres but some changed 4.3 metres to centimetres by dividing by 100.

Question 9

Parts (a) and (b) were both answered well, although a small number of students gave an answer of e^4 in (a). The expression in part (c) was also usually simplified correctly but even those who failed to gain both marks often got credit for either $8x$ or $3y$. Part (d) was more challenging; most students realised that a was the common factor but errors included omitting a term inside the bracket or leaving the answer as $a(4b + 7a - a)$.

Question 10

Part (a) posed very few problems but a number of students struggled to find the cube root of 9261 in (b); some found the cube of the square root of 9261 instead. In part (c) (i), most were able to find the value of 6.1^4 but not so many wrote their answer correct to 2 significant figures in (c) (ii); incorrect responses included 1380 and 14.

Question 11

Students were generally able to use the probability scale in part (a), particularly in part (i) when the probability of landing on 4 was zero. In part (b), completing the table posed few problems, although some wrote the numbers the wrong way round. Finding the probability from the table in (c) was more of a challenge; some students simply didn't use the table, while others included the case when the number on both spins is the same.

Question 12

The majority of students were able to find the area of shape **P** in part (a) (i), although some found the perimeter. Part (a) (ii) proved to be more of a challenge. Some drew a shape congruent to **P** while others didn't increase all the sides by the same factor. Most students were able to reflect the shape in the line *QR* in part (b), although some reflected the shape in a different vertical line. Others simply translated the shape. In part (c), students struggled to describe fully the transformation. Some used coordinates rather than a column vector although most described it using words. The name of the transformation was not known by many, with words such as 'move' and 'transformation' sometimes being used.

Question 13

Most students scored at least one mark in part (a) although some gave an answer of 16 or 15.8(333…). Those who scored both marks in (a) usually proceeded to answer (b) correctly. Those who didn't often struggled with (b) and gave an unrealistic answer.

Question 14

Many students answered this correctly by identifying the number of marbles of each colour and then subtracting. Some stopped after dividing the total number of marbles by 8 while others just found either the number of red marbles or the number of green marbles.

Question 15

Most students were able to find the sale price in part (a) with most initially finding 12% of 36 and then then subtracting from 36; some simply multiplied 36 by 0.88. A numbers of students just found 12% of 36 while others found 12 as a percentage of 36. Many students also answered part (b) correctly although incorrect solutions included 81/100 × 180 and 180/81 × 100.

Question 16

Most students were able to write down the modal number of goals in part (a), although some found the median instead. Likewise, part (b) was accessible to the majority, although some added the 'number of goals scored' column and others found the mean. Part (c) was more problematic with some students finding the probability that two or more goals were scored and others not able to make a start.

Question 17

Students who recognised this as a trigonometry problem and who also chose the correct trigonometric ratio were very likely gain all three marks. Some chose the wrong trigonometric ratio, most commonly cosine, while others attempted the question using Pythagoras' Theorem. A number of students lost the accuracy mark as a result of premature rounding.

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Question 18

There were a variety of approaches to part (a), some correct and others not. A significant minority found the perimeter of shape **A** while others simply multiplied the lengths of each side by each other. It was also quite common to see 6 × 3 + 8 × 2, which gained one mark. Many students failed to see the link between parts (a) and (b). Some simply found the square root or cube root of 350 in (b); others divided 350 by (8 × 6).

Question 19

Students who were able to attempt part (a) often added 4 to both sides of the inequality while others attempted to subtract 4 but then wrote $8p = 7$. Those who made a correct first step then often failed to switch the inequality sign and so forfeited the final mark. In part (b), many students scored at least one mark, usually for three correct terms. Only a relatively small number weren't able to make a start. Part (c) was answered well, although occasionally the powers were divided rather than subtracted. Students typically scored one mark in part (d) for either $3e^2$ or $9e$. Part (e) highlighted a lack of understanding of index rules for many students. Some worked out $2^2 \times 2^3$ incorrectly as 4^5 or 2^6. Those who got as far as $4^n = 64$ then often struggled to find the value of n.

Question 20

Students often struggled to understand how to attempt part (i). Many gave an answer of 2, 23, 31, although others did manage to gain marks for listing other factors of 1426. Many did not see the link between parts (i) and (ii). Some attempted using a factor tree in (ii) but this frequently went wrong.

Summary

Based on their performance on this paper, students should:

- refrain from rounding numbers prematurely
- check to see whether their answer is realistic
- learn the basic rules of indices
- be able to identify congruent shapes and similar shaped
- learn the difference between the main types of transformations