Examiners' Report

Principal Examiner Feedback

January 2018

Pearson Edexcel International GCSE

In Mathematics A (4MA0) Paper 1F

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Students who were well prepared for this paper were able to make a good attempt at all questions.

On the whole, working was shown and easy to follow through. Despite this being a paper where the use of a calculator was allowed, a number of careless arithmetic errors were seen. When calculators were used then premature rounding sometimes caused inaccuracy in the final response.

There was some evidence that not all students were familiar with functions on their calculator. For example, many were unable to enter negative numbers correctly or find the cube root of a number.

Question 1

The first three parts of the question were very well answered with few errors seen. The first part to cause students difficulty was part (d) where a variety of numbers other than 36 were offered as the square number between the limits given. Some students gave the response of 6, failing to recognise that the value of 6^2 was required. There were a surprising number of wrong answers in part (e) with these generally being 16.8, 16 or 20. A disappointingly large number of students were unable to use their calculator to convert the fraction given in part (f) to a decimal. Incorrect answers invariably used the digits in the question in some way, for example 7.16 or 16.7. Students should be reminded then if an answer is a finite decimal then this should not be rounded. Part (f) was well answered although some students did shade only two squares, presumably believing that one square represented 10%, or 5 squares.

Question 2

By far the most common error in part (a) was to transpose the x and y coordinates; this error occurred more frequently in (ii) than in (i). Many incorrect answers were seen in part (b), the most common of which was rhombus. Many students placed a cross in 'the centre' of the trapezium at (2.5, 0.5) believing that this was the midpoint of BD. A significant number of students gained one mark for one correct coordinate. When asked to find the midpoint of a line, students would be well advised to draw in the line first in order to correctly identify the midpoint.

Question 3

This question was extremely well answered with very few incorrect answers seen.

Question 4

The incorrect answer of 'obtuse' was probably seen more often than the correct answer 'reflex'; acute was also a frequently seen incorrect answer. In (b), values in the range $53^o - 57^o$ inclusive were acceptable; the sight of answers such as 30^o, 50^o, 90^o, 120^o etc did suggest that some students either did not have a protractor in the examination or else did not know how to use the protractor they had with them. Answers in the region of 125^o certainly suggested that some students were using the wrong scale. If there was a wrong answer in part (c) then it tended to be because the sides adjacent to the 130^o angle were marked.

Question 5

This question was well answered although there was evidence of some careless arithmetic.

Question 6

Responses in part (a) were generally correct, although some believed a pen could weigh 14kg. However, success was much more varied in part (b) with the conversion factor from litres to millilitres clearly unknown by many students. Multiplication (or even division) by 100 rather than by1000 was a very common incorrect conversion.

Question 7

Part (b) was answered better than the other parts in the question. In part (c) some students found the square of the given number rather than the square root. Ordering decimals caused problems for a surprising number of students.

Question 8

Throughout this question there were a noticeable number of blank answer lines. The wrong operation was sometimes chosen in the method to solve the equations in the first three parts of this question. This was most noticeable in part (c) where 4 (from division rather than multiplication) was a very common incorrect answer. Similarly, 24 (from addition rather than subtraction) was seen relatively frequently in part (b). cd^2 was a common incorrect answer in part (d). Some students were unsure how to cope with the x^2 part of the expression with incorrect answers of 14^2 and $14x^6$ seen, as was 126 (from $9^2 + 7^2 - 2^2$).

Question 9

Many correct answers were seen. It was, however, disappointing to see some students fail at the last hurdle due to careless arithmetic – for example, errors such as 160 – 108 = 152 and 160 – 108 = 72 were seen. Some students chose to convert $^3/_8$ into a percentage (or decimal); this method was acceptable but students should be reminded to work with accurate conversion. For example, using 38% or 37% rather than 37.5% resulted in an incorrect answer. Full accuracy should always be maintained throughout a solution. A number of students gave the answer as

32.5% failing to apply the percentage to the number of cakes. The most common error seen was to find 30% of 160 then subtract this from 160 before finding 3/8 of this number (112) rather than finding 3/8 of 160.

Question 10

Part (a) was very well done. Finding a scale factor in part (b) proved problematic for a significant number of students with many blank responses or incorrect responses seen. Some students attempted to find the area of the larger shape rather than the scale factor.

Question 11

In part (b) there was clear evidence of student unable to identify 'angles on a straight line' with y, 38^o and 38^o used as angles on a straight line. Students need to be reminded that, when asked for a reason, it is not appropriate to write out the working – a written reason is required, that uses precise geometric terminology. Part (c) was well done with few incorrect answers seen.

Question 12

It was surprising to see an even number (24 or 26) given as a prime number reasonably frequently in part (b). It was clear that many students did not know how to use their calculators to find the cube root of 19863 in part (c). A very common incorrect response was 420.8... which comes from taking the square root of 19863 and then multiplying by 3. Although many correct answers were seen in part (d), some students were unable to convert the decimal 0.625 into a percentage with 0.625 and 6.25 seen occasionally as the final answer. There were also a significant number of answers where students just attempted to use the figures given in the question; 58 and 5.8 for example.

Question 13

Both parts of this question were well done.

Question 14

Some students misunderstood the question in part (a) and wrote down an event which they thought was certain to happen, for example, 'the sun will rise' and 'walk the dog'. Of those that did understand, some failed to realise that, when asked for a probability, a numeric value should be given. Hence, answers such as 'certain' and 'definite' did not gain the available mark. There was some poor arithmetic seen in (b) with 1 – 0.3 occasionally incorrectly evaluated as 0.97. The use of the word 'estimate' in part (c) caused some students to write down a random number rather than use the information about the probability given in the question

Question 15

On the whole this question was well done with many correct answers seen. Occasionally, the prime factors were given in a list rather than as a product or a non-prime number – usually an odd number (9 or 45) – was left in the list.

Question 16

Part (a) was reasonably well done; far fewer correct responses were seen for part (b). A number of students wrote 90 as the answer to part (b) presumably because for green the number of buttons was 30 less than the angle. There were a surprising number of blank responses to part (c). Of those who write down the correct fraction, some failed to simplify fully. 45° was a common incorrect answer to part (d) which came from using the bag of buttons rather than the tin.

Question 17

It was clear from the responses seen to both parts of this question that many students were unable to recall the metric conversions necessary to move from kilometres to centimetres. There was also confusion over whether to multiply or divide. Both parts of this question called for division which then brought the further complication of knowing which number to divide by. Ideally, students should be able to look at their answer and question its reasonableness. Getting, for example, a distance on a map of 1 750 000 cm should have raised concern. The most common incorrect answer in part (b) was 4 – again, an improbable answer given the context of the question.

Question 18

Many correct answers were seen for part (a). However, some students did give an incorrect answer; if no correct interim values were shown then no marks could be awarded. The main error in part (b) was to round to 2 decimal places rather than the required 2 significant figures.

Question 19

It was disappointing to see so many students unable to square a negative number correctly; this is something that students should be able to do without a calculator. The most frequently seen answer to this question was the incorrect -14 from evaluating $-7^2 + 7 \times 5$ rather than $(-7)^2 + 7 \times 5$. There was more success with substituting the positive numbers in part (b). The common error here after a successful substitution was to subtract in the wrong order with $100 = 121 + 7q$ frequently rearranged incorrectly to give $121 - 100 = 7q$ and thus an answer of 3 rather than the correct -3. A number of students worked with $7q$ and -21 , but not as an equation, often giving -21 as their answer

Question 20

Few correct answers were seen to all parts of this question. The most popular incorrect method in part (a) consisted of ordering the frequencies and then selecting the middle number of the ordered list (15) – the spinner number of 5 associated with this frequency was sometimes also given.

The most common (incorrect) answer in part (b) was 16 from 80 ÷ 5. With the highest number on the spinner being 5, this is clearly an impossible answer so it was disappointing to see it occurring so many times. Those students who did multiply the number on the spinner by the frequency to get a total of 280 then frequently divided by 5 rather than 80.

The most common answer in part (c) was the incorrect fraction of $^2/_5$ from those students who spotted that there were 2 even numbers out of the 5 numbers on the spinner but failed to use the relative frequencies. The denominator of the fraction was sometimes given as 81 from those students who mistakenly thought they had to include the spin about to be done.

Question 21

In part (a) it was not uncommon to see an incorrect final answer of 0.8 from the division 8 ÷ 10 rather than the correct 10 ÷ 8. Students who expanded the bracket correctly frequently then failed to cope with the rearrangement of the equation, often, when the 3 was subtracted correctly 6y rather than the correct $-6y$ was left on the left hand side of the equation.

Some correct responses were seen to part (b) but, more often than not, either the answer line was blank or the response given was along the lines of $-3 \leq 4$ which gained no marks. When asked to solve an inequality it is essential that the final answer is an inequality. Hence, in part (c) a final answer of just -2.5 or $m = -2.5$ gained just the method mark. The fact that the answer was negative seemed to confuse some students who decided that this meant they had to reverse the inequality and so gave the answer as $m \leq -2.5$ which also gained just the method mark. There were few fully correct answers seen to this part of the question.

Question 22

By this stage of the paper the majority of responses were blank or incorrect; not uncommon in a foundation paper. Students who recognised the need to use Pythagoras's Theorem in part (a) were fairly evenly split between those who substituted correctly and those who squared and added. Students would be well advised to write down uncorrected values from their calculator before attempting to round to the given accuracy. It was not uncommon in part (a) to see a final answer of 8.8 rather than the 3 significant figures demanded by the question. In both parts it was common to see sin(5.9/10.6) evaluated as 9.71, an indication of a misunderstanding of trigonometry

There was evidence in part (b) that some students were calculating the size of angle *QPR* rather than of angle *PRQ*. Provided angle *QPR* was clearly indicated on their diagram then the first method mark could be awarded. Students are advised to mark the angle they are calculating on their diagram. Some students lost accuracy in their final answer due to premature rounding; the value of the fraction used in their trigonometric ratio was sometimes rounded before using the inverse trigonometric function.

Common incorrect answers in part (c) were 12.4, 12.44, 13 and, intriguingly 6.2 (half of the given value).

Question 23

Few part marks were awarded in the marking of this question; graphs drawn tended to be either fully correct or completely wrong or blank. A few students plotted points and then omitted to join them.

Question 24

A good number of correct bisectors with correct supporting construction arcs were seen. Some students clearly had no idea what was required of them while some simply drew in a bisector rather than producing a construction.

Summary

Based on their performance on this paper, students should:

- learn to identify and name all the quadrilaterals
- learn to identify and name different types of angles
- practise fraction, decimal and percentage conversions
- learn metric units conversions
- practise entering negative numbers into their calculator and be able to use all the necessary functions.