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Examiners' Report/ Principal Examiner Feedback

Summer 2013

International GCSE Mathematics A (4MA0) Paper 2FR

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General comments

Many students found the paper accessible, but challenging in some areas. Good levels of numerical ability were demonstrated, both in use of calculator and in the solution of problems, including those involving percentages. Standard questions were generally answered with success, especially on the earlier two-thirds of the paper. Some students were not aware that when solving equations, algebraic methods have to be shown. Trial and error/improvement is not acceptable.

Question 1

Part (a) was answered very well. There were occasional blank responses and "912" was also seen occasionally. All sub parts of (b) were also done very well with only sporadic errors or occasional blank responses.

Question 2

The initial parts of this question dealt with the interpretation of a pictogram. This was excellently done although students were less sure when they dealt with the fractional part as they had to when completing the line for Sri Lanka. The fraction of 20 was also answered confidently and was almost always correct.

Question 3

This question tested knowledge of mathematical terms associated with a circle. In all parts about half of the responses were correct. For parts (a)(i) and (a)(ii), the responses did not follow any pattern. In part (b), many students drew a chord rather than a tangent.

Question 4

This question tested knowledge of scale and of place value. In general, all parts apart from (c)(ii) were answered well. However, students were not successful in identifying the size of the 6 in 8.367. Those that were successful generally wrote the value as 0.06 which was acceptable for the mark. Those that got the question wrong supplied a variety of answers such as 'tenths' or 'tens' or 'sixths'.

Question 5

The vast majority of students were able to calculate the next term in the sequence (486) and most were able to explain how the next term of the sequence was found. Most supplied the answer that successive terms are multiplied by 3. There were a few explanations which were more complex but nonetheless correct, for example, by using differences.

Question 6

In part (a), most students left the answer space blank or put down 'parallelogram' on the answer line. The remaining parts of the question were well done, although many students measured the length of each of the sides of the rhombus and then added rather than using the equilateral property of the rhombus and measuring just one of the sides.

Question 7

Virtually all students got part (a) correct. In part (b), students were usually able to calculate 22% of the population and then write down the answer correctly. Some students used the word 'million' whilst others converted to full numerical form. In part (c) most students were able to write 6% as a decimal. Those that did not score the mark had usually written 0.6

Question 8

Part (a) was almost always answered correctly. The most common wrong answers were 1 and -1.

Part (b) proved to be more of a challenge, as some students were unaware of how to solve the equation. However most knew the correct processes of finding 1 -7 and then dividing by 3 to get -2.

Question 9

All parts of this probability question were answered well as all the answers could be found by counting from the diagram that was given. One wrong answer that did appear quite often was for part (b) where students wrote down the probability as 0 instead of the correct 1 or $\frac{10}{10}$

Question 10

This question tested knowledge of coordinates and simple geometrical figures. The first 3 parts of the question were answered well. However, for part (c), some students thought that the correct order of rotational symmetry of a rectangle was 1 or was 4. Answers to part (d) were generally correct, with students finding the mean of the x coordinates and the mean of the y coordinates.

Question 11

The area was almost always worked out correctly.

Question 12

Part (a) was invariably answered correctly. Many students were able to calculate the cube of 2.8 in part (b)(i) but some students tried to work out the cube root or even the square root. In part (b)(ii) most students could round their answer in (b)(i) correct to 2 decimal places. In part (c) the calculation was almost always done correctly but the rounding to 2 significant figures was poor with in many cases the answer of 169.38... being rounded incorrectly to 17.

Question 13

Most students scored 3 marks on the question. The most common method was to use opposite angles of a parallel are equal and the angle sum of a quadrilateral is 360^{o}. Only a few students seemed to use supplementary angles on parallel lines.

Question 14

In part (a) the substitution and subsequent calculation were generally accurately carried out. Part (b) proved to be more difficult. Some students when faced with 6(-5 + 2) decided to expand the brackets rather than work out the bracket. Sometimes this led to expressions such as -30 + 2

Question 15

In part (a) students were very successful in both writing down the correct fraction and then cancelling it to its lowest terms. Part (b) was done much less successfully. Common errors included writing the ratio using 12 and 20 rather than 12 and 8, writing the ratio the wrong way round to give 2/3 to (0.66:1) and rounding of the ratio 1.5 :1 to 2: 1, presumably because the candidate thought that unitary ratios always had to be whole numbers.

Question 16

There were a number of students who could name the transformation correctly as a translation. 'Translate' was also accepted, but not 'vector', 'transposed', 'transition' or 'transferred'. There was some confusion over the description of the translation with, in many cases, the vector given being that from Q to P rather than P to Q. Other wrong answers included the vector with the x and y components transposed. Answers such as '2 squares to the right and 1 square up' were also accepted, but not ' 2 squares across and 1 square up'.

Question 17

It was pleasing in part (a) to see so many students with a good strategy for finding the median in a frequency table. The more able students wrote cumulative frequencies down the side of the table and selected the value corresponding to the 25th item. Others were long-winded and wrote out the table in a list and selected the middle of the list by counting. Also, many students selected the middle number in the table (5).

Part (b) proved to be accessible for many students with a good number scoring all 3 marks and only few students scoring no marks at all. A number of students divided the total number of letters (280) by 5 and were content to write down 56 on the answer line as the 'typical' length of a word. Part (c) proved to be much less successfully answered with many students being unable to understand that the next word must have the nearest whole number of letters below their answer to part (b).

Question 18

Many students scored full marks on part (a)(i), although some just worked out the reduction ($42) rather than the sale price. There was less success on part (a)(ii) where some students misinterpreted the demand and divided by 85% rather than 15%, or used a wrong method by multiplying £24 by 1.15 or its equivalent.

Similarly, part (b) was misunderstood with some students working out $\frac{7}{12}$ of $320 presumably from a misconception that the $320 was the total amount. In general, however, this part was also well answered, in some cases with a sophisticated approach such as $\frac{7}{5} \times 320$

Question 19

Part (a) required the use of angles on a straight line and angles on parallel lines. The most common successful approach was to work out angle ABC as 68^{o} and then use alternate angles. Some students thought that angles BCD and CDE were equal or that the interior angle at C was equal to the exterior angle at D. A number of students thought that angle ABC was 67^{o}.

The most direct way of working out the answer to part (b) was to use the sum of the exterior angles of a polygon. Many students did this and were not penalised if they had used an incorrect value for their answer to part (a). The most direct way of completing part (c) was to use the interior angle sum formula for a polygon. Many students instead used the formula for the internal angle of a regular polygon and came with the answer of 108, not noticing that this was smaller than some of the interior angles they had already worked out in part (b). Some students worked out the sum of the interior angles they found in the polygon.

Question 20

For students who were comfortable with the pair of inequality signs part (a) proved to be no problem. They solved the inequalities by operating simultaneously on both sets and were able to write down the solution almost immediately. Part (b) was even more successfully answered with the many students scoring both marks. A few lost out by omitting 0 or including 3 in their list of integers which satisfied both inequalities.

Question 21

It was pleasing to see so many students being able to use the formula sheet to accurately calculate the value of x. The successful students were able to identify the need to use tan and complete the question. Some students very efficiently used $\tan^{-1}\left(\frac{3.2}{5.8}\right)$. A few saw the right angled triangle and decided that the question was about Pythagoras and calculated the length of the hypotenuse.

Question 22

Most students recognised that the two base angles were equal and many wrote the equation $3x + 32 = 87 - 2x$. Once that was done, virtually all of those students went on to find the correct value of x by solving the equation. A few students thought that the remaining angle in the triangle was x and tried to set up an equation by using the angle sum of a triangle. This was given no marks. However, many students who recognised the equality of the base angles did not write this down as an equation nor showed any algebraic manipulation to solve for the value of x. These students, even if they got the value 11, were given no marks.

Grade Boundaries

Grade boundaries for this, and all other papers, can be found on the website on this link:
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