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Examiners' Report/
Principal Examiner Feedback

Summer 2015

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

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Introduction to paper 2FR

The paper was accessible to most students with many scoring well overall. Students often performed better on questions relating to number and algebra, but were less successful at handling data. There seemed to be an appreciation of the need to show method although a small number lost marks for failing to do so.

Reporto n individual questions

Question 1

Few errors were seen in this opening question. In part (a), there was the occasional misunderstanding of the value of the 3 in 4.23 and in part (d), some students failed to grasp decimals places.

Question 2

All parts of this question were answered well, although students sometimes answered part (d) with a fraction equal to $\frac{1}{4}$. In some cases this may have been due to errors in mental arithmetic rather than a lack of understanding of the question.

Question 3

In part (a), those who understood the term 'tangent' usually drew one at *B* correctly although occasionally some were drawn at other points on the circumference. A reflex angle was usually marked at O although there were other correct options. Some students thought an angle less than 180 ‘ was a reflex angle. Most were able to recognise line *OB* as a radius but were less successful at shading a segment, sometimes confusing this with a sector.

Question 4

Although most students understood the meaning of frequency in part (a), some used the tally column for frequency and the frequency column for cumulative frequency or relative frequency. Others didn't complete the tally column at all and chose just to use the frequency column. In part (b), the overwhelming majority of students were able to find the mode if their table in part (a) was correct. Occasionally, some chose the frequency rather than the score. Students weren't quite as familiar with the range; some wrote the answer as 1-3. In part (d), most students were able to correctly describe the likelihood that the score on a fair dice as unlikely although incorrect responses often described it as likely, rather than certain or impossible.

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Question 5

In part (a), students were usually able to identify an isosceles triangle, although it was spelt in a number of different ways. Some responses incorrectly thought the triangle was equilateral. In part (b), students were not always familiar with the terms similar and congruent. There were a number of incorrect responses for marking the centre of rotation in part (c)(i). It was often marked on one of the corners of triangles *A* or *D*. Likewise in part (c)(ii), incorrect angles of rotation, such as 45° and 90°, were sometimes given.

Question 6

Almost all students were able to find the fifth and eighth term of the sequence in part (a) and most could describe the rule in part (b) for working out the terms of the sequence. Some used the difference between two terms to describe the rule whilst $n - 8$ was a common incorrect response.

Question 7

Students were usually able to write 40% as a fraction in part (b). Some didn't fully simplify 40/100 and others did so incorrectly, even occasionally attempting to simplify 2/5 further. A few wrote their answer as 0.4. In part (c), most students were able to write down a correct ratio and simplify it to 5:3 but writing it in the form 1: *n* proved to be too challenging for many.

Question 8

Students who had an appreciation that part (a) was related to BIDMAS often either referred to how $4 + 9 \times 3$ could be changed to equal 13×3 or how 13×3 could be modified to make it equal to $4 + 9 \times 3$. Some correctly evaluated $4 + 9 \times 3$ as 31 but weren't able to describe Neha's mistake in terms of the order of operations. In part (b)(i), some subtracted before dividing. Furthermore, a number of students worked out the answers to be 1 and 5 in parts (i) and (ii) respectively, but then made up their own sum to equal these, for example, $5 \times 1 = 5$ in part (ii).

Question 9

Students were usually able to correctly find the mean although a small number omitted the brackets in their working or found the median.

Question 10

Most students demonstrated an ability to reflect a shape. Some, however, found it easier to reflect the shape in the vertical line of symmetry. Others extended the given shape to form a parallelogram.

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Question 11

Students found it easier to list elements of the intersection of sets S and V compared to the union of S and V. Some listed all the members of S and V for the union whilst others thought the union couldn't include elements from the intersection. Occasionally, students got the union and intersection the wrong way around.

Question 12

In part (b)(i), many students gave 4 50 as the time for 16 50 using the 12-hour clock. In part (b)(ii), there were many incorrect attempts, including subtracting 16 50 form 19 12 and adding 22 minutes to their 19 hours − 16 hours. Others subtracted 12 from 50 and then deduced the answer was 3 hours 38 minutes. In part (d), those who knew the relationship between speed, distance and time often divided 638 by either 165 or 2.45.

Question 13

Most students drew a triangle so that either QR measured 7.3 cm or angle QPR was 60°.

Question 14

The majority of students scored well in this question. There was some confusion in part (b) with answers given for the probability of the pointer stopping in a sector with an odd number rather than in an unshaded sector with an odd number.

Question 15

There was some misunderstanding about the meaning of cube numbers and prime numbers but students tended to score well in most parts of this question. In part (e)(ii), it was quite common for students to incorrectly round 3.2710 to 2 significant figures, opting for 3.2 rather than 3.3.

Question 16

Most students were able to solve the equation in part (a) although some attempted to simplify $7 + x$ to $8x$. The equation in part (b) proved to be more challenging with some adding 3 to both sides of the equation and others re-writing $-9 = 8y + 3$ as $-6 = 8y$.

Question 17

There was often confusion between the median and mean. Some calculated the product of the Number of students and chose the middle number. Others ordered the frequency and chose the middle number.

Question 18

There were a variety of responses for this question. In parts (a)(i) and (a)(ii), some students plotted the point (2, 0) for $x = 2$ and (0, 3) for $y = 3$. Others drew a line through (2, 0) and (0, 3). Part (a)(iii) was more challenging, although many students were at able to draw a line with a positive gradient through (0, 2). In part (b), it was rare to see point P marked in the correct position although some gained one mark for positioning it to the right of the line $x = 2$.

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Question 19

Part (a) proved to be more accessible than part (b). Saying that, this question exposed a general misunderstanding of percentages. In part (a), some only found $7\frac{1}{2}$ % of 15000 whilst others simply just added $7\frac{1}{2}$ to 15000 or multiplied $7\frac{1}{2}$ by 15000. In part (b), students rarely appreciated that 1800 rupees represented 8%. Some multiplied 0.08 by 1800 or 1.08 by 1800. Others gained one marked for dividing 1800 by 0.08 but then failed to add 1800 to 22500.

Question 20

Most students seemed to recognise that this question related to trigonometry although some tried to apply Pythagoras' theorem. Many, though, weren't able to to form a correct equation, with Sine or Tangent frequently being chosen as the function to use. Those who did start with cos56 = $\frac{7.4}{x}$ often incorrectly followed this with x = 7.4cos56.

Question 21

In part (a), students often divided 175 by 16 (rather than 7) before multiplying by 9. They were more likely to score well in part (b) because it was a more standard ratio problem.

Question 22

Errors were rarely seen in part (a). In part (b), those students who had some idea how to expand double brackets usually scored at least one mark although incorrect signs prevented some from obtaining a fully correct answer. In part (c), many students found dealing with −2 problematic. Some gained one mark for a correct substitution but then often simplified $(-2)^3$ or $-k \times -2$ incorrectly.

Question 23

Part (a) was accessible to most students with most scoring full marks. In part (b), some students multiplied 0.44 by 0.42 rather than adding. There were a variety of responses in part (c), with some students dividing 1200 by 0.04 rather than multiplying.

Question 24

Students often scored one mark for the finding the area of the two circles or the curved surface area. Some treated the shape as an open cylinder and added then area of one circle to the curved surface area, scoring two marks.

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Summary

- Students would benefit from understanding the differences between the mean, median and mode.
- When asked to write the time using the 12-hours clock, students should be aware of the relevance of am and pm.
- When finding the length of a side of a right angle triangle using trigonometry, careful thought should be given to choose the correct function.
- Students should be encouraged to use brackets when substituting a negative number into an expression, such as in Question 22(c).
- Marks can be lost when not reading the question carefully. For example, taking note whether a cylinder is open or closed.

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