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Examiner Report

Principal Examiner Feedback

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International GCSE Mathematics
A (4MA0) 2FR

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Principal Examiner's Report
International GCSE Mathematics A (4MA0)

Introduction to Paper 2FR

This paper allowed students to demonstrate their ability across the assessment criteria. Students often got mixed up with terminology such as area and perimeter as well as with formulae linked to the circle. Several students showed their working, but too many are losing marks when they give an answer very close to the correct one but with no working.

Report on Individual Questions

Question 1

In (a) many answers were correct but unfortunately several students wrote down the smallest number (1344) rather than the smallest odd number.
For part (b) many students gave the correct answer but a common incorrect answer was 'hundredths' rather than hundreds. The difference must be stressed to students.
In (c) the vast majority of students were able to correctly find the difference between the two numbers, but a few added.

Question 2

Students generally did well on this pictogram question. In part (a) virtually all responses were correct. Again, in (b) very few responses were incorrect – only those that had misread the question. In (c) the majority of students gave the correct response. A few students drew '4 more books' on March rather than drawing the symbols in April. A few students also incorrectly drew 4 more lots of the complete symbol – so in effect 32 more books.

Question 3

3(a)(i) was mostly correct but a few students decided the shape could be made into a 3cm by 4 cm rectangle showing 3×4 and giving the answer 12.
3(a)(ii) was mostly correct and some students giving answers such as 19 or 21 seemed to have the correct method but were not quite careful enough. Those students who, in part (a)(i) thought the shape was a 3 by 4 rectangle gave the answer 14 in this part. Some students got mixed up with perimeter and area, which is often a common mistake.
In 3(a)(iii) most students gained the mark for a correct single line of symmetry. There were several blank responses and some who thought that there was a horizontal and vertical line of symmetry as well as a few who also added diagonal lines of 'symmetry.'
In 3(b) the vast majority of students were able to label an obtuse angle on the diagram, but a few marked an acute angle and a minority split the shape into two triangles, for some reason.

Question 4

This question was generally well done.
4(a) was almost always correct.
In 4(b) the majority gave the correct answer with just a few misreading the scale and giving answers such as 7.37.
In 4(c)(i) we saw many correct answers but a few marked the arrow at 7.225
For 4(c)(ii) some gave the answer as 7.2, ie to 1 decimal place rather than the nearest whole number; reading the question carefully is essential.

Question 5

In 5(a) most students were able to correctly write down the coordinate of point A, although the common mistake of writing the numbers the wrong way round was seen.

5(b) was mainly correct with just a few students giving the point one place out, e.g. (-5, 1)
In 5(c) we saw a good amount of responses giving the correct answer of pentagon, but some incorrect answers such as hexagon and heptagon also appeared.
In 5(d) almost all students were correctly able to measure the length of the line.
For Question 5(e) we allowed the usual tolerance of +/- 2 so any answer in the range 37 – 41 was able to gain the mark. While many students benefitted from this mark, several students appeared to read to the wrong side of 40 and give answers such as 42 and 43. 45 was also an incorrect answer seen several times.

Question 6

Without fail, students were able to give the correct answer in 6(a) for the number of sticks in pattern 4
For 6(b), a correct answer of 'add 3' or +3' was often seen. Those students who tell us the difference is 3 cannot be awarded the mark as a difference of 3 could mean we add 3 or subtract 3. It is essential that students just tell us what they did. The mark was also awarded for the correct term which was seen on a number of occasions.
6(c) was frequently answered correctly. Incorrect answers, while close to the correct one, but without working gained no marks. We would accept, for a method mark, a list of at least 5 correct terms so students must be persuaded to show working.
For part (d), some students found the number of sticks for pattern 67 rather than the pattern number with 67 sticks –reading the question and understanding what was required is essential.

Question 7

For part (a), most students gave the correct month of January.
In part (b) we saw many correct answers and those that showed $13 - -2$ but with an incorrect answer (often 11) could gain a method mark. Again, lack of working did cost some students who showed an answer close to the correct one.
Part (c) was mostly correct and a few benefitted from a method mark for -4 + 28.

Question 8

For part (a) we saw many correct answers and those incorrect frequently assumed that the numbers in the table were in the correct order. Students must be reminded that this may not always be the case.
In part (b) we saw many correct answers for the median, but some students found the mean and some used the order of the table instead of arranging the numbers in ascending order. A few benefitted from a method mark for putting the numbers in order. Some feel the median should have a 0.5 attached to it and gave the answer of 178.5. Also a common wrong answer was found by adding all scores and dividing by 2
Part (c) was generally very poorly done and students do not seem to know why the median can be a better average to use than the mean. Many blank responses were also seen.

Question 9

This question had a very high success rate across all the parts.

Question 10

Full marks was gained by over 90% of students on this question.
The main mistake made was not realising the need to find the cost of 6 plants; the cost of just one plant was taken from £20 and this gained 1 mark only.

Question 11

In part (a) the correct answer was given by the majority but there were a fair number of students who gave the decimal rather than the fraction equivalent to 23%.

Part (b) appeared to be more successful than in previous sessions – this may have been because the decimal conversions, even when truncated gave different decimal values. If students did not score full marks they often gained 2 marks for 4 numbers in the correct order or 1 mark for 2 fractions correctly converted to decimals or percentages.

Question 12

Part (a) was often correct but a few saw a minus sign in the question and so gave the incorrect answer of 4e – 11f. These students were able to benefit from a method mark for 4e or 11f.

In part (b), although we saw the correct answer of $\frac{3}{7}$ frequently, some students gave a 2 significant figure answer and were unable to benefit from the accuracy mark as we were looking for 3 significant figures, which is the usual level of accuracy. If we saw the correct fraction, full marks were awarded even if followed by a 1 significant figure or 2 significant figure value on the answer line. Those showing no working often lost themselves method marks, even though we were almost certain they had used a correct method but did not show this with an accurate answer.

Part (c) was mostly correct although a few tried to further simplify their answers to $12p + 15 = 27p$

For part (d) we saw many correct answers but some students had forgotten how to factorise and thought it meant simplify, giving 20r as the answer. There were also a number of students who gave the answer as $6(r + \frac{7}{3})$, appearing to think that the number in the first term should be the common factor.

Question 13

For part (a) the correct answer of 729 or 9 cubed was seen quite regularly. Some students missed reading the word 'cube' and gave the answer 700 as the number between 650 and 750 and a few found the cube root of 700.
For part (b), while the correct answer of 89 was seen several times, the incorrect answers of 87 and 91 were also common.
In (c)(i) many failed to find the cube root of 72 and found the square root or the cube. For part (c)(ii), 2 significant figures all too often got mixed up with 2 decimal places.

Question 14

Many correct answers were seen for this area of a trapezium question. A few students multiplied 6 and 10 instead of adding. It was strange that some students wrote the formula out

without a mistake and then substituted numbers and replaced the addition sign by a multiplication sign.

Question 15

Quite a lot of correct responses were seen for this question but some students struggled with the concept of volume and divided the sum, rather than the product, of the three given sides of each shape by each other. It was common to see the addition of 3, 5 and 6 the numbers of times the small carton could be put along each side of the larger carton: a method mark was awarded for seeing 3, 5 or 6. Some students found the correct 2 volumes, only to subtract them; for which they gained M1 for a correct volume.

Question 16

A pleasing number of correct answers were seen for this question. Some students used the fraction 100/24 (=4.166..) and rounded this to then multiply by 30 and gave a 'nearly correct' answer that lost the accuracy mark. Students need to remember to use their calculator value and not round and delete as this causes inaccuracies.
For part (b) there were many correct answers. Some students expected the answer to be a whole number multiple of 24 crunchy bars and tried a build-up method, but then when faced with 250g of chocolate left after adding 300 + 300 could not get any further.

Question 17

Part (a) was fairly well done. Some students, rather than subtracting the probability of a spin of 1 from 1, tried to add all other values and worked out the probabilities of 3 and 4 incorrectly. This was a long way round and students must realise that asking for 'not' in probability needs for the probability of that item taken from 1. A few students took 0.15 from 100 and must be reminded that one should work either in decimals, percentages or fractions but not get confused with a mix of percentages and decimals.
Part (b) was generally well done, with most students correctly adding 0.15 to 0.4. A few put their answer over 1 which is not needed but we did not penalise here.
Part (c) caused a lot of confusion and as the word twice was in the question, many students incorrectly thought they should divide by 2 rather than 3. 0.15 was also given as an answer rather than 0.3 in some cases, gaining just 1 mark. Students must remember to read the question very carefully.
(d) This rather typical question at the end of a probability problem was generally very well done. A few students incorrectly thought that a probability of 0.4 meant they should divide the number of spins by 4.

Question 18

Students clearly get confused with symbols relating to set notation and this was seen here by some of the answers we received. There were also several blank responses for this question. Some students incorrectly think they should repeat numbers in sets but this was penalised, and it should be noted that a number should just appear once in a set.

Question 19

This was very well done for a more advanced question on a Foundation paper. Common mistakes were to use the circumference of a circle rather than the area. A few students also used the formula for the area of a triangle rather than a rectangle. The majority of students picked up at least one method mark for this question, often for the area of the rectangle.

Question 20

Many students gave the correct answer for this percentage reduction. A few gained a method mark for 420, forgetting to take it away from 1200. Then we had some common mistakes which often involved dividing 1200 by 35 or 0.35 and also subtracting 0.35 from 1200.

Question 21

While many students recognised that they should be using Pythagoras' theorem to find the missing side of the triangle, many squared and added rather than subtracted. A few students tried to use trigonometry but this was not an efficient method and needed a good start in order to be awarded any marks and most who tried using this method failed. There were also several blank responses.

Question 22

Students at this level often find dealing with negative numbers and substitution a struggle. Part (a) of this question was no exception with the most common value of minus five squared being minus twenty-five. If students had shown a fully correct substitution including brackets around the minus five before squaring they could pick up M1. M1 was also awarded for sight of 25 or +15, and sometimes students benefitted from this. Substitution involving negative numbers remains an area that students need more work on.

Students at this level also find indices difficult to deal with, and in part (b) we saw the common misconceptions of treating indices as ordinary numbers and $w^5 \times w^8$ becoming w^{40}. Some students were however easily able to gain the correct answer.

Part (c) was done very well by a good number of students and those that had forgotten how to give the inequalities completely correctly were often able to pick up a method mark for one end of the inequality being correct. A few, had no idea that they needed to have an x in the middle and just incorrectly used some numbers from the number line.

Question 23

We saw some correct answers that gained full marks and a few that just gave an answer of 10 which alone gained no marks because of the clause in the question that stated 'show clear algebraic working'. Many students did not understand what was required for this question, with many stating that the two give angles were equal to each other. Some correct answers used the most efficient method of summing the two given angles to 180 but some doubled each and summed to 360, both of course were perfectly acceptable methods. Most students who knew how to start, completed the question and gained full marks, so generally we saw 0 marks or 3 marks awarded here.

Question 24

Correct answers were few for part (a) and very seldom seem in part (b). We saw many blank responses or 'guesses' at the angle. A few students were able to pick up a method mark for starting trigonometry and selecting cosine and the correct sides linked with cosine x. Students find bearings very difficult and some students took their answer to (a) from 180 or 360 but more often left the bearings question completely blank.

Correct answers were few for part (c), many students mistaking 2 significant figures to be the nearest whole number, giving the very common incorrect answers of 109.5 and 110.5. There were also a good number of blank responses.

Summary

- Students must show clear working to maximise their potential to gain marks;
- Students must use the correct formula for the area and circumference of a circle; these are currently on the formulae sheet;
- When using a calculator, students should keep figures rather than clearing and putting in rounded figures as they may lose marks due to accuracy;
- When a question says ‘show clear algebraic working’, students will not gain marks unless they do so;
- More work should be done on substituting negative values into formulae.

Grade Boundaries

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

http://qualifications.pearson.com/en/support/support-topics/results-certification/grade-boundaries.html