Examiners' Report
Principal Examiner Feedback

Summer 2017

Pearson Edexcel GCSE
In Mathematics A (1MA0)
Foundation (Calculator) Paper 2F

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GCSE Mathematics 1MA0
Principal Examiner Feedback – Foundation Paper 2

Introduction

Performance was polarised mainly at the upper end of the ability range for this paper with those who were clearly aiming to pass at grade C. There was some evidence of a concerted effort to gain marks on certain questions, whilst there were some topics where performance was very weak. Weakest areas included algebraic manipulation and derivation, percentage calculations and questions involving conversion, both between units and between currencies.

Performance on unstructured questions was better near the front of the paper, but much weaker in the later parts of the paper. However, there were too many attempts that resembled trial and improvement approaches.

The inclusion of working out to support answers remains an issue for many; but not only does working out need to be shown, it needs to be shown legibly, demonstrating the processes of calculation that are used. There were too many instances in this paper where simple arithmetic errors were made, even when calculators were available.

Report on individual questions

Question 1

This question was usually well answered, with only a few putting the arrow in part (c) at 7.4 after having misread the scale.

Question 2

The only error in the first three parts was where the coordinates were given in reverse order. In part (d) many students found placing the point difficult; in many cases the point given failed to produce an isosceles triangle.

Question 3

Most students were able to gain at least 1 mark on this question for finding 51, 54 or 57. Many did not go for the most efficient method of dividing 200 by the relevant cost, instead choosing a trial and improvement style multiplication method. Those that did use the division method generally went onto score full marks. A small number of students misunderstood the information in the question, thinking that the first 29 calculators cost £3.85, the next 70 cost £3.65 etc.

Question 4

Parts (a) and (b) were answered well. In part (c) a minority plotted the point at 1/8, 3/8 or indeed some other point.

Question 5

A significant minority gave a wrong answer in (a). Sometimes it was the radius, sometimes an inaccurate diameter, but other figures given could only have come from a guess, perhaps indicating the lack of a ruler for measuring. In part (b) many showed a sector, with some confusing this with a segment. Part (c) was badly answered, with tangent, segment, diameter and radius being common incorrect answers.

Question 6

This was generally well answered. Some students needed to show greater care in writing their answers, since repeats (eg SP and PS) were penalised. Students chose to either use abbreviations or write the words out in full; either way was acceptable. Unfortunately, some failed to read the question correctly and gave a list of possible choices from all three columns on the menu, which could not be credited.

Question 7

Whilst not many students achieved full marks on this question, many were able to pick up several method marks and so overall most students did score something. However, a significant number of students were not able to add the four times together to reach 3.5 minutes and of those who did, many interpreted 3 minutes 30 seconds as 3.3 minutes and used this in subsequent calculations.

Question 8

A few shaded just 2 squares, which could not be given the mark. Otherwise part (a) was well answered, with many showing one from the many permutations possible. A few spoilt their attempts by giving a shape that had 2 lines of symmetry. Part (b) was less successful, with some just repeating what they had shown in (a).

Question 9

Most students divided into 768 and 749 and then compared the results, after having deduced that 14 buses were needed in both cases. A few compared 13 buses instead, losing the final mark. An appropriate alternative method was to work out the number of places in 13 and 14 buses, comparing these results with 768 and 749 people. Weaker students worked out the number of buses for just 768 or 749, giving a conclusion, which therefore made little sense and so gained one mark only.

Question 10

The quality of working out was generally quite good; a majority of students drew dual bar charts, included a key and used a linear scale on the vertical axis; others drew line graphs. Many lost the final mark because they did not label the vertical axis. Heights of bars were most often correct, with a key usually included. Some unusual scales were chosen - going up in 3s or 2.5s (5 for every 2 squares) didn't work so well but 2s were seen often. There were cases with

lots of different widths and evidence of the absence of rulers. Line graphs were not so good; there was frequently scaling issues where some didn't know where to start or finish the graphs.

Question 11

Many gave the correct answer in part (a). Students traditionally find time duration problems difficult, and the same was the case here. In part (b) many methods were seen which involved the times 935 and 1013, or attempts to add 50 onto 935. This was not always done by adding on 50. Rather in both cases students were seen accumulating smaller amounts of time, for example adding on lots of 5 min to 935, hopefully ten lots in the case of adding 50. But some students lost their way at this point, losing track of how many lots of 5 minutes they had added on, or making errors when going through 10 00am. Another common error seen was students using 1 hour = 100 minutes to gain 0985 from 0935 + 50 – students still gained 1 mark for this for an intention to add 50 minutes on to 0935.

Question 12

Part (a) was well answered, but in part (b) many gave the result of 5 from a division of 15 by 3, rather than a multiplication. In part (c) it was unusual to see any algebraic notation used. Rather students adopted a variety of trial and improvement approaches, which could earn credit only if the final answer was correct, which then got two marks.

Question 13

There were many good attempts at this question, with full marks frequently being given. Weaker students were at least able to deduce that each side of the triangle was 10, usually by writing it on the diagram. Most who showed a complete method went on to give the correct answer. Of those who went on to find the missing width the most common mistake was to forget to divide by 2 and thus arrive at an incorrect answer of 8

Question 14

The most common error in this question was where students confused statistical terms. This was evidenced by students finding means in any part, or confusing mode with median. In part (a) the mode was stated correctly by most students. To find the median the numbers had to be listed in order, and credit was given for doing this, irrespective of where the order was shown on the page. Having produced the list, some students were confused by having two middle numbers, sometimes giving them both rather than the answer of 5.5. Many knew what the range was, but some found the range of the unordered list.

Question 15

In part (a) there was a variety of answers, including rhombus, parallelogram, quadrilateral, but less frequently trapezium. In part (b) any method to count squares proved fruitless since the part squares were too difficult to judge. Greater success was demonstrated by those who divided the shape into triangles and/or rectangles. Part (c) was very well answered. In part (d) students usually gave correct lengths for the top and bottom of the shape, but producing correct sloping sides was more problematic.

Question 16

Many students gained at least one mark in this question, usually for converting any number of inches into centimetres. Many students failed to include the 4 inches when converting the height of the bus into inches only. Of those that did get to 172 inches, most went onto gain 3 marks. The majority of those going wrong were unable to convert 14 ft 4 in to inches, quite often students would simply do 14 × 12 = 168 followed by 168 × 2.54. Others would often get a correct answer of 436.88 but would then make a comparison to 4.4 m and not 440 cm, or they wouldn't convert accurately to 4.36 m.

Question 17

The method shown on the mark scheme was used by the most able but others used a breakdown method getting 500 g and 4.84, 100 g and 0.968, 50 g and 0.484 which often resulted in full marks. Those that rounded these values often gave 6.28 and so did not get the final accuracy mark. Many other students were able to gain one mark for showing 1 kg = 1000 g and others for the answer 62.92 which showed they understood the correct method but had incorrectly used 100 g to the kg. Only rarely was incorrect money notation seen on the answer line.

Question 18

Parts (a) and (c) provided little difficulty for students, though the common error in (c) was to only give 6 for a one-way journey. In part (b) several time durations had to be found before arriving at the answer. It was not uncommon to find only one of these being given such as 20 min or 27 min.

Question 19

The majority of students scored marks on this question. In general it was the fraction calculation that let most down. Most of these students converted 1/3 to 30% and thus failed to score any method marks for “Best Vans”. The calculation for “Vans for Hire” was generally accurate and scored two marks. It is clear that students need to become more familiar and confident calculating a fraction of an amount and I think this question highlights that 1/3 is one they do not like. More able students that correctly calculated both costs wrote good explanatory conclusions. The standard on writing conclusions has definitely improved over the last two years.

Question 20

Most students attempted conversion into decimals, usually having some difficulty in converting the 3/7 and the 2/5. Sometimes ordering was almost random, perhaps relying on estimates of equivalence. Most were able to gain at least one mark, for which a single error in ordering was permitted.

Question 21

This was a well answered question. Nearly all students generated a correct list of numbers in part (a). The greatest error in part (b) was in plotting the points, but not joining them. A few plotted only some of the points from their table.

Question 22

In general students used the words given in the question to formulate their own question, and were capable of giving appropriate response boxes which were exhaustive and non-overlapping.

Question 23

Few students managed to access this question. Common calculations were finding 30% of 1295. Some recognised 70% was 1295 but were unable to work out that you need to divide by 70 or 7 and not by 10 or 100. A few attempted to find 35% by 1295/2 but were unable to carry on from there.

Question 24

This conversion question had a variety of ways of approaching it but most students went down one of two routes: converting Paris and Geneva prices to pounds or converting the London price to both Euros and Swiss Francs. The former method generally led to three marks and the latter was either one or three marks depending on whether the student made the correct choice of London. The student who gained no marks did not know how to deal with the conversions correctly.

Question 25

Most students gave a correct response in part (a), with only a minority trying to describe the relationship, or describe the trend in the points. Many also gave an answer in the given range to gain both marks in part (b). The main error was in not using the scaled axes correctly, or in using an inappropriate line of best fit, such as one drawn as a diagonal.

Question 26

There were many students who scored £127 for the difference between the season ticket and the individual games cost. The majority of students were then unable to find what percentage one quantity is of another but often used a trial and improvement method to try to find an answer which was vaguely but not specifically correct. This was true of other percentage questions on the paper. Of

those who found 76.99% by evaluating (425/552) × 100, this was often not subtracted from 100%. It was rare to see the correct final answer.

Question 27

This was either done correctly or completely wrong. Lots of combinations were seen, including squaring then subtracting, adding the sides (some halved 509 but gained one mark). Lots of students multiplied 19.3^2 and 11.7^2 or added and failed to square. A surprising number appeared to have no knowledge of Pythagoras' Theorem at all.

Question 28

Trial and improvement was by far the most seen approach to this question with very little, if any, reward. A small minority appreciated the algebra element to the question but were unable to form an equation worthy of any merit. Those using algebra scored for simple expressions such as "x + 24". This was a very poorly answered question. There was also confusion as to which expression to multiply by 5, and then they often forgot to multiply the number term.

Question 29

Very few students scored full marks on this question. Many simply added (or multiplied) all the numbers together without realising the need for the use of π. Where the circumference was found, students often forgot to halve to find the semi-circle. Very few students remembered to add 4 cm onto their answer and therefore missed the second method mark and the accuracy mark. Once having worked out the circumference there did not seem to be much problem finding the number of rolls needed nor calculating the cost of the rolls, although some failed to round up to an integer number of rolls.

Summary

Based on their performance in this paper, students should:

- Present working legibly and in an organised way on the page, sufficient that the order of the process of solution is clear
- Check their arithmetic, even if carried out on the calculator
- Show all working out for each question
- Practice algebraic manipulation and derivation, percentage calculations and conversion between units and currencies
- Spend more time ensuring they read the fine detail of the question to avoid giving answers that do not answer the question

Grade Boundaries

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