Principal Examiner Feedback

Summer 2014

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

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GCSE Mathematics 1MAO
Principal Examiner Feedback – Foundation Paper 2

Introduction

This paper was found to be reasonably straight forward at the start but a number of the later questions that caused some candidates problems particularly 18(b), 21, 24, 28 and 29. The paper produced a good range of marks for the award of grades. Errors were often made where the candidates did not read the question carefully e.g. question 3.

Generally speaking, the standard of straightforward algebraic knowledge was not very good as candidates tended to use trial and improvement methods in the solution of any equation. Unless a trial and improvement method leads to a correct answer then no marks are awarded unless trial and improvement is the focus of the question. Candidates usually gained more marks for using an algebraic approach to the solution in those questions where an algebraic method could have been used rather than by using a trial and improvement method. This was particularly the case in questions 26(a) and 28

A significant number of marks were lost where candidates did not write down a statement of the result in the starred questions. Circling an answer is insufficient as we need to see a statement giving the required decision based on written evidence. A statement of how to work something out will also not gain any marks when a question requires an explanation.

It is still surprising to see the number of candidates who did not have access to equipment as many candidates chose to draw their answers to questions involving the drawing of straight lines freehand. This was not penalised where those lines were reasonably straight. Since this was a calculator paper it was surprising to see candidates losing marks for inaccurate arithmetic – presumably either because they did not have a calculator or because they chose not to use the one they had.

Some students give more than one method and more than one answer. If they choose one of the answers to write on their answer line that is the method which will be awarded marks, but many do not do so and give us a choice of answers. This was often apparent in questions 18(b), 21 and 24.

Reports on Individual Questions

Question 1

A well understood question with all parts well answered by all candidates.

Question 2

This question was well attempted by those candidates that had a ruler. A surprising number did not so were at a disadvantage in part (a) though they could find the midpoint of the line in (b). The other part involving drawing was well answered though many drew a diameter rather than a radius with the occasional chord sometimes seen and sometimes the line extended beyond the circumference. Measuring an angle was usually well done though the supplementary angle was sometimes given.

Question 3

The standard bill type question was very well answered with many candidates giving the correct answer. The most common error in this question was to omit the second fish and chips and the three other puddings; these candidates were awarded 2 marks for an answer of £26.15 which would be the correct answer from their incorrect assumption. A few did not use a calculator when subtracting and gave an incorrect answer of £3.75 or £4.25.

Question 4

Less than half of the candidates answered this question correctly with many giving the answer of 3.2 or 3.3 and a significant number wrote $3.2\frac{1}{2}$ which also was not accepted.

Question 5

This question was well understood but sometimes not very well answered as candidates tended to write 600 rather than 28 600 in part (a) thousand rather than 20 000 in part (b). The success rate for part (c) though was much higher with almost all candidates obtaining the right answer. A significant number of candidates included a decimal point in the answer as a delimiter and this was not accepted for the mark in part (c).

Question 6

Candidates answered this question very well with two marks being obtained by most candidates. Some candidates included Janette as well and were not penalised whilst those candidates that included duplicate entries were. A minority of candidates thought this was a probability question with answers such as "…it is more likely that a boy is picked…"

Question 7

Finding the congruent shapes was well answered, but many candidates could not find the triangle that was enlargement of triangle **A** as **C** and **D** were often given as the most common wrong answers. Interestingly though, many candidates could give the correct scale factor as 2 even without the correct answer for part (b)(i) being given.

Question 8

This question was not well understood or well answered. In part (a) many candidates gave the answer of 36 extra squares needed, ignoring the 9 given squares and many just gave 9 or 18 as their answer obviously not understanding each side of the new square was 6 cm. Those who actually drew a 6 by 6 square and counted the extra squares were usually more successful. In part (b) more candidates understood the question but struggled with establishing the pattern needed to get to the seventh term. The candidates that were most successful were those that drew pattern number 7 and counted their triangles, sometimes incorrectly, though many used a build-up method with partial success.

Question 9

Candidates were much better prepared for this type of question and they performed very well usually giving the correct answer of £4.80. Due to the way the question was worded candidates could also score full marks for an answer of 40p, the saving per month. Interestingly some candidates followed their calculator display and showed lack of thought for currency by writing £4.8; this was not penalised in this question though those that wrote £4.08 were.

Question 10

A fairly typical response for this question was to give the answer of 11 i.e. the candidates gave the middle value of the original list rather than ordering the list first. There were also those cases where the candidates gave the mode and some even calculated the mean. Many candidates chose to use 8 of the numbers instead of 9 and lost marks because of carelessness.

Question 11

This question was well understood and part (a) was well answered with almost all candidates able to draw a kite with rhombuses and squares condoned. In part (b) almost all candidates were able to draw a rectangle but few candidates were able to draw one with a perimeter of 14 and many drew rectangles with areas of 14 cm^2. Almost all candidates gained one mark in (c) either for drawing at least one correct line of symmetry or for drawing two correct lines of symmetry and drawing additional incorrect lines.

Question 12

Candidates were less successful in part (a) than part (b) as there was much confusion in candidates minds between seats and tables in part (a) whilst in part (b) the scenario was more understandable to them and as a result their success rate was a lot better. Many also calculated that there would be £17 left even though this was not required. A few lost the C mark as they failed to answer the question with yes

Question 13

This question was not really well understood by candidates and many could not cope with the complexities of the diagram. Many simply divided the length and width of the garden by 4 whilst others tried to calculate the area of a flower bed.

Question 14

The most successful part of this question was part (a)(ii) as most candidates could cope with counting the number of faces in the triangular prism. Part (b) was answered reasonably well though candidates at this level often find interpreting 2_D representations of 3-D shapes quite difficult. The part candidates made the most errors on was part (a)(i), finding the number of edges on the shape even though all 9 of them were drawn in for them.

Question 15

This question was reasonably well answered with many candidates able to give correct responses for a factor of 6 and a multiple of 6 though inevitably many mixed the two up. In part (b) it was gratifying to see so many correct responses with many candidates able to state that 2 was a prime number. Many candidates chose to describe square number or stated that 12 was a prime number or said things such as "all even numbers are odd"

Question 16

Parts (a) and (b) in this question were well answered but when it came to giving the equation of the line, few candidates were able to write $x = 3$. Many gave two coordinates on the line and the usual incorrect response of $y = 3$ was the most common error seen in this part whilst in part (a) the point marked was often (-2, 3) or (−3, 2).

Question 17

This question was poorly answered with the exception of part (a). Many candidates in part (b) just added up the 0, 1, 2, 3, 4 and 5 to give the answer of 15 and then wrote down the answer of 2.5 in part (c) obviously making the classic mistake of dividing by the number of rows in the table.

Question 18

Almost all candidates were able to change £200 into rand successfully in part (a) but in part (b) they struggled to work to the degree of accuracy needed to gain all three marks but many were able to score one mark by giving one correct conversion from rand into pounds or pounds into rand and some were then able to put together enough conversions to get close to the required accuracy and score two marks for a complete method. The quality of the conclusions made by a significant number of candidates was not of a particularly good standard as the comments made about the items that can be purchased, did not always reflect the figures they had calculated.

Question 19

There was a mixed response to this question. Many candidates tried to set up a questionnaire or draw a graph and scored no marks as we needed to see a standard 3 column data collection sheet with type of transport, tally and frequency as labels for the columns. Each correct column gained a mark. A few candidates lost a mark as they had columns headed frequency and total rather than tally and frequency though total was condoned instead of frequency.

Question 20

The mode for this question was 2 marks. Almost all candidates realised that they had to multiply 1500 by 8 and then by 60 for which they received the two marks. Unfortunately most candidates could not take this to the next stage by multiplying by 330 m*l* as they either divided by the 330 or if they multiplied they then did not divide by 1000 preferring to use 10 or 100 as the number of millilitres in a litre.

Question 21

This question differentiated very well as most candidates could make a start by writing two equivalent fractions but only the best could give the correct conclusion from three correct equivalent fractions, decimals or percentages. Some candidates tried to use a diagram but didn't realise that their diagrams were not comparable because they hadn't split them into the same number of sections. It was disappointing to see so many candidates rounding prematurely thinking that ⅔ is equivalent to 0.6 so losing marks.

Question 22

Travel graphs are usually well understood and this was the case here as far as the horizontal line was concerned but drawing a slant line of the correct gradient proved too difficult for most candidates.

Question 23

This question about powers proved a bit too difficult for many candidates. Part (a) was the best answered as candidates could use their calculators to work out the correct answer but after this candidates did struggle with p^5 often being given as an incorrect answer for (b). Part (c) was usually better answered and in part (d) a few more gave the correct answer of 6.

Question 24

Candidates could usually make a start on this starred question and many candidates scored 1 mark usually by dividing the numbers of students by 12. They then usually became unstuck as they did not know whether to round up or down within the context of the scenario. Those that worked out the correct answers to the pupil teacher ratio then struggled to work correctly with the number of teachers needed and the number of students they could supervise. They did not think about what their answers showed and were unable to interpret them to give the correct answer. For example dividing by 15, 13, 14 and 12 showed how many students were assigned to each teacher, and so needed to be 12 or less, but many gave the answer for the days where this worked out at 12 or more. Candidates who multiplied the number of teachers on each of the days by 12, then compared them, were much more successful; however this approach was not the most commonly seen.

Question 25

This scatter diagram question was well understood and well answered with most candidates able to score marks usually for plotting the points although some plotted (14, 6) instead of (13,6) so losing the mark. The mark for giving the relationship as negative correlation was usually scored though those candidates that answered with simply "negative", without the word correlation, were not awarded the mark. Part (c) was answered correctly by more than half the candidates but lines of best fit were seldom seen.

Question 26

The equation solving in this question certainly gave most candidates a problem as they did not know how to deal with the fractional answer less than 1. Few candidates gave the answer correctly as ⅔ preferring to give it incorrectly as 1.5. Candidates were also poor at showing the steps algebraically, often showing just the arithmetic required and that scored no marks unless a fully correct answer was given though a few scored a mark for showing $3p = 2$. Part (b) was better answered with many candidates gaining one mark as they either omitted the zero or included the −5 in the inequality.

Question 27

This question was often attempted but not very successfully. Candidates could not deal with substituting $x = 0.7$ correctly into $(x + 1)^2$ as they often wrote it as $0.7 + 1^2$; others thought that $2x$ should be written a $2 + 0.7$ rather than 2×0.7. The most common incorrect answer was 1.0115 where candidates had not used brackets when dividing by (2×0.7).

Question 28

Candidates struggled with writing the lengths of the sides of the trapezium algebraically which made accessing this question difficult. Candidates could get some marks though for a numerical approach though many wasted time with exhaustive but fruitless trial and improvement attempts.

Question 29

Candidates understood they had to find the missing side *AB* in this right angled triangle but often just added the two sides of 32 and 24. Only about a third of candidates realised they had to square and add the lengths if the right angled triangle with many subtracting instead. In part (b) a lot of the candidates assumed they had to find the areas of the two mirrors rather than find the perimeter of the mirrors and so scored no marks. Very few candidates were able to give a fully correct solution to this question though partial credit was often earned for trying to find the circumference of the circle and the perimeter of the triangle. Those who did try to find the perimeter did not take account of the fact that the metal strip is sold in lengths of one metre when trying to find the cost. Most candidates did not associate part (a) with part (b).

Grade Boundaries

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