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Principal Examiner Feedback

November 2016

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

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GCSE Mathematics 1MA0
Principal Examiner Feedback – Foundation Paper 1

General Comments

The students entered for this exam paper showed lots of evidence of positive achievement as they were able to score marks on questions throughout almost all of the paper. This provided a very good range of marks for the award of grades across the whole ability range.

Though most students showed their working there were still far too many cases when it was often disorganised, showed a lack of clarity and was without a logical progression. Sometimes this caused students to lose marks when it was not possible to follow their train of thought. This was especially evident in Questions 24 and 25.

Many students may well have lost marks through writing their numbers indistinctly. There were many cases where it was not possible to distinguish between 5s and 2s also 1 written with a leading line often looked like a 7.

Performance in the basic skills of algebraic manipulation has improved though dealing with representing inequalities and solving inequalities remains poor.

Almost all students had the necessary equipment which was gratifying to see although a few students drew their straight line graphs freehand which was acceptable as long as there was not too much curvature in their straight lines.

Reports on Individual Questions

Question 1

A well understood and answered question with almost all students gaining full marks. Those that made errors usually miscounted the 2 stickmen for swimming as 2 rather than 4 and hence lost the marks for the total in (b), since only the final figure of "8" could be followed through.

Question 2

Whilst almost all students realised that the question was about angles and measuring some mistook obtuse angle for acute, reflex or even right whilst many gave the acute angle answer of 45° rather than 135° for the answer to part (c).

Question 3

Almost all students realised that m/ was the answer to the volume of water in a glass but many wrote miles for the metric measurement for distance rather than kilometre. Kilogram was often seen instead of tonne for the weight of a bus as was imperial ton.

Question 4

This question on shopping bills was well understood and usually well answered. Common mistakes in (a) were to only give two ways for spending the 75p. There were examples of students duplicating answers in different orders to arrive at 75p i.e. Ruler + pen being seen as one option and pen + ruler being seen as a different option which resulted in too many options for 75p. In (b) almost all students could find the total of £3.45 but then could not take this away from £5 accurately; common wrong answers were £2.55, £2.45 and £1.65. Students often used counting on methods rather than formal subtraction. Part (c) was very poorly answered with y = 20 and 30y often seen as an expression for the total cost of pencils.

Question 5

This question on building up number patterns was well answered by the majority of students with almost all being able to give correct answers to the numerical components. The explanation was not so well answered with many not being able to give a complete explanation as to how they found their answer.

Question 6

Students at this level often struggle with questions dealing with calculations involving time and confuse 24h time with 12h time so 6 am, 6 or 06 00 were common wrong answers. The first two questions were relatively well answered but when it came to a calculation involving the addition of a journey time and the subtraction of a time difference many students failed to subtract the time difference and added it on instead. A common error was to think that New York was 7 hours or 19 hours ahead rather than 5 hours behind.

Question 7

Almost all students were able to plot at least one point correctly from those given with about half of the students being able to follow through to give a fully correct answer to this question. A common error is still to plot the coordinates in reverse and (4, –1) was often seen as students had confused trapezium with parallelogram.

Question 8

Whilst many students could read the scale in part (a) evidenced by lots of students writing 1.7 or 0.3 either in the working or on the diagram; many students could not then proceed to change this into grams , with the incorrect conversion of 100 grams in a kilogram frequently seen, there were many answers of 30 and 3. In part (b) students achieved much greater success with many being able to give the correct answer of £21. When students had problems these came from not being able to read the scale correctly with each division being equivalent to 2 kg.

Question 9

This question on using number cards was usually well answered though a surprising minority of students did write single digits for part (a) and (b). Students were most successful with parts (a), writing the largest number, and parts (c) and (d), writing the probability of a card with or without a 7 on it. Disappointingly, some students gave the answer as a likelihood or as a ratio rather than as fraction, decimal or percentage. Part (b) was not well answered as students struggled to write the largest even number made up from the cards. Many students gained partial credit for any even five-digit number or the largest number.

Question 10

Students usually understood what they had to do in this question and many were able to change 4 metres to centimetres correctly and subtract the 40 cm for the posts. They often fell down when they divided by 4 rather than 3 falling into the usual misconception that if you have 4 posts then you have 4 fence pieces rather than the 3 shown in the diagram. Students need to be aware that where units are not provided on the answer line they are expected to write their own.

Question 11

This question on algebraic manipulation was well answered with most students being able to score 4 out of the 6 marks available. Areas requiring improvement are dealing with positive and negative numbers of variables and substituting correctly into a formula. Surprisingly a significant number of students retained the variables *k* and *m* in their answer.

Question 12

A good proportion of students were able to make a start on part (a) of this question by writing the area of the rectangle as 24 and the area of the triangle as 6 and then go on to explain that $\frac{6}{24}$ was equivalent to $\frac{1}{4}$. Most students fell down when they tried to explain that four of the shaded triangles made up the rectangle having failed to realise there were only two of this sized triangle in the rectangle. They seemed to assume that dividing the rectangle using the two diagonals produced 4 congruent triangles. Part (b) was usually correct.

Question 13

Surprisingly only about three quarters of students were able to give a correct answer in part (a) though almost all students were able to score in part (b) for the comparative graph. Fully correct solutions to this commonly tested topic were rarely seen with most students either falling down by not using a linear scale on the vertical axis or for not labelling it correctly or for errors in their column heights.

Question 14

This question was well understood with almost all students being able to gain one mark for attempting to write all the numbers in the same form or for placing 4 of the numbers in the correct order. Of all the conversions students had the most difficulty with converting $\frac{2}{5}$ to a decimal or percentage.

Question 15

This question was not well understood. Despite the question asking for a suitable table for a data collection sheet many students gave a questionnaire as a solution with some even drawing a graph. About half the students gave a fully correct answer with some gaining partial credit for one or two correctly labelled columns, usually for method of transport and tally.

Question 16

Most students were able to gain one mark for this question usually for showing the vertically opposite angle as 50°, or the adjacent angle as 130°; these were often shown on the diagram. A good proportion of students were then able to go on and find the correct answer of 25°

Question 17

This question was well understood and well answered with almost all students giving the correct answer to parts (a) and (c). Students were slightly less successful in part (b) as they sometimes gave the distance from Jane's home rather than the ice rink.

Question 18

Students either scored well in this question or poorly dependent on whether they understood the concepts of enlargement and tessellation. In the enlargement part students often scored one mark for enlarging two sides of the shape correctly and in the tessellation part one mark was scored by those students that were able to show 4 shapes tessellating with or without extras and gaps. Many students seemed not to understand that the shapes had to fit with no gaps so rotations of the shape were unlikely to fit together.

Question 19

This question on ratio was poorly understood with few students realising that the counters in the ratio of $1 : 5$ is equivalent to writing the fractions $\frac{1}{6} : \frac{5}{6}$. Students found parts (b) and (c) even more difficult as they failed to understand that the 20 counters given were yellow and not the total number of counters in the bag. Partial compensation was given in (c) for those students that realised that the answers to parts (b) and (c) should add to 10.

Question 20

This question discriminated very well with almost all students gaining one mark for showing at least three correct combinations and about half then going on to give the correct answer to the question. The final mark was sometimes lost because the students gave the wrong fraction for their probability or wrote it as a ratio e.g. 1 : 9. For those that realised the probability of a letter was ⅓ and the probability of a number was ⅓ often scored one mark only because they added rather than multiplying these fractions.

Question 21

This question was very well understood with almost all students gaining one mark for showing that they had to multiply £6.45 by 18. Many methods for this calculation were seen but comparatively few examples of formal long multiplication. Alternative methods give plenty of scope for arithmetical error. Most students were able to show that they had a complete method to calculate how much cheaper a season ticket is than individual tickets and these students gained 3 marks. About a third of students being able to give the correct answer to the question.

Question 22

This question was poorly answered with students often giving the frequency rather than the modal class interval in part (a) and in part (b) only about one in three students was able to give a fully correct answer to the frequency polygon with the most common errors being not to plot the mid points of the class interval and to join the first (25, 6) to the last point (65, 2) mistakenly thinking they were drawing a polygon.

Question 23

A good proportion of students were able to score two marks in this question for a basic understanding that they needed to find an area, usually 7 × 4 (= 28) and then they needed to divide their area of the path by 10 to find the number of bags of gravel. It was rare to see a fully correct answer as few students were able to give a complete method to find the area of the path with some working with perimeters and others with volumes.

Question 24

Students realised what they needed to do in this question but often lacked the mathematical ability to carry out the task successfully. Most students were able to gain 1 mark either for a method to find 60% of £1500 or ⅓ of £1500 and two marks if they did both. However, that was usually the end of any marks earned as students made one of two classic errors. They either scored no further marks for adding 60% and 15% and then tried to find 75% of £1500 or they forgot to subtract 60% of £1500 i.e. £900 from £1500 and then found 15% of £900 rather than £600. A considerable number of students worked with 33% or even 30% rather than $\frac{1}{3}$.

Question 25

This question was also poorly answered; it was very rare to see a fully correct solution. Some students made a good start by marking angle *DBC* on the diagram as 55° and the angle *CDB* as 95° but then could not find the value of angle x as 95° which needed to be linked with the correct angle and it was very rare to see an angle property of parallel lines identified so no communication marks were earned.

Question 26

Fully correct solutions for this inequality question were rare with students often marking a region greater than 3 rather than less than 3 in part (a) and shading the inside of the circle rather than leaving it open or putting circles at both ends of the line with one open and one closed. In part (b) solutions of $x = 5$ were often seen and this gained one mark as the ≥ sign was frequently missing.

Summary

Based on their performance on this paper, students should:

- always lay out their working in a logical progression so that their method can be followed easily
- write their figures clearly and distinctly being careful to distinguish between 3s and 5s also between 1s and 7s
- remember that in a frequency polygon the mid points are joined but not the first and last points
- give reasons next to the working in questions where reasons are asked for
- practise representing inequalities on a number line and solving them algebraically

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