Examiners' Report
Principal Examiner Feedback

November 2024

Pearson Edexcel GCSE (9 – 1)
In Mathematics (1MA1)
Foundation (Calculator) Paper 3F

GCSE (9–1) Mathematics 1MA1

Principal Examiner Feedback – Foundation Paper 3

Introduction

This paper provided good coverage across the specification and allowed learners the opportunity to demonstrate their ability across the grades. Plenty of success was seen across the early part of the paper as learners showed confidence picking up marks in the first half of the paper.

Learners generally performed best on questions involving numerical processes, for example Q8 (costings), Q9 (fractions and percentages of amounts) and Q14 (rates of pay). The majority of questions from Q15 onwards proved difficult for this cohort.

Areas of the specification that need to be improved upon are highlighted in the list at the end of this report.

Report on individual questions

Question 1

This opening question was answered well with the majority of learners gaining 1 mark, usually for an answer of 700, although answers of hundreds or 700 written in words were also accepted and seen regularly. The most common incorrect answers were 3700 and 100.

Question 2

This cohort performed well on this question with almost all able to score 1 mark for an answer of 16.

Question 3

This question was answered well with most learners able to gain B1 for 2 correct factors. A good number gave more than 2 factors which was allowed as long as they were all correct. Common incorrect answers were 2,3 and 4,4.

Question 4

This question was answered very well with almost all learners gaining 1 mark for a correct answer. It was acceptable to give the list of numbers in descending order but this was rarely seen.

Question 5

This question was answered very well with almost all learners gaining 1 mark for a correct answer. Most gave their answer as 1.5 but some left in fraction form, e.g. $\frac{3}{2}$, which was also acceptable.

Question 6

Part (a) was answered well with most learners able to give a correct answer of 5 for one mark; the most common incorrect answer seen was 24. Part (b) also saw plenty of success with most learners giving the correct answer of 17 for 1 mark; the most common incorrect answer was 3, presumably coming from truncating the answer of 24 ÷ 7. Part (c) was also answered well; common incorrect answers included 2, 4, and 6.

Question 7

Part (a) saw mixed results, a good number of this cohort were able to give a correct answer of trapezium; common incorrect answers included parallelogram, rhombus and prism. Part (b) was answered well with many able to gain one mark for a correct triangle. Those that used the given gridlines to draw their right angle generally gained B1, those that didn't often struggled, although angles of $88 - 92°$ were accepted for the right angle. Common incorrect answers included drawing isosceles or scalene triangles and failing to draw the hypotenuse of the triangle.

Question 8

Part (a) of this question was answered well with the majority of learners gaining 3 marks. Each value was marked individually; for those that did not gain 3 marks, it was the total for tin of paint that caused most problems. For those that did not get the correct value of 49.9(0), there was a follow through for the 3rd B mark where if they added their 4 totals together accurately they could gain the mark and this was seen often. Part (b) also saw the majority of learners gain 3 marks for a correct answer of 771.45. Of those that didn't, common errors included failing to use the correct operation for all 3 values e.g. adding 365.50 instead of subtracting and there was also a significant number of misreads seen, presumably due to the large number of digits involved in the question. A small number of learners saw the word interest and tried to work out 4.47% of 892.48.

Question 9

This question was answered well with most of this cohort able to gain 5 marks for a correct answer. There were a variety of processes in the mark scheme for learners to gain credit from with the most common seen being to work out the number of child vegetarians and subtract from 80, and the number of adult vegetarians and subtract from 120, and add these two results together. Some of this cohort were unable to make any progress on this question, not being able to deal with finding $\frac{2}{5}$ of 200 being the main issue.

Many learners did not gain marks because they failed to show their process when finding fractions or percentages of amounts, for example $35\% \times 80$ does not gain credit without an accurate result, whereas 0.35×80 is worth P1.

Question 10

Part (a) was answered well with a good number of learners able to give the correct answer of 19; incorrect answers were varied and showed no clear pattern. Part (b) saw more mixed results. In (i) a good number of the cohort were able to interpret the information correctly and gain a correct answer of 08 11. Some misinterpreted the information and added 6 and 8, then subtracted from 09 00, gaining 0 marks. There was a Special Case B2 available for an answer of 08 08 (the learner who chooses the correct train but does 08 14 – 6) and 08 09 (the learner who identifies 08 17 but subtracts 8 instead of 6) and these were seen often, 08 08 more so than 08 09. Some learners arrived at the answer of 08 11 but subtracted more time to allow for delays; centres should note that learners should work with the given information in the question and not include further interpretation of their own. (ii) also saw mixed results, although a good number gained B1 for a correct answer; common incorrect answers in the main talked about Barnie being able to leave later.

Question 11

In part (a), a good number were able to gain 1 mark with a correct answer of 16. The most common incorrect answer was 15.2, presumably from misinterpreting the scale on the horizontal axis. Part (b) was not answered well with few learners gaining 3 marks. To make progress readings needed to be taken from the graph that could be used to convert 50 kilometres into miles and a variety of different ways of doing this were seen. A tolerance of one small square was allowed for the reading but it was still common to see inaccurate readings given in the workspace. Even if inaccurate readings were taken, the second method mark could still be gained if the readings were used in a complete method and this was often seen. Some learners attempted to convert 17 miles to km and go from there; this rarely led to a correct answer but it was often awarded the first M1 for an accurate reading.

Question 12

This question saw mixed results. A good number of learners were able to give a correct expression. Some gave the correct expression but did incorrect further working such as 'simplifying' to e.g. 13xy or 13, gaining M1A0. Some also turned their expression into a formula such as T = 6x + 7y or Total = 6x + 7y, showing a lack of understanding of the definition of an expression. There were also a good number who gave expressions that were completely incorrect such as $x^6 + y^7$. Some learners used a and o instead of x and y, this could only gain credit if a and o were defined as number of packs of apples and number of bags of oranges respectively.

Question 13

This question saw the full range of marks awarded, with a small number of learners gaining 4 marks. Of those that didn't, a variety of errors were seen such as,
- no/incorrect conversions (but could still gain 1 or 2 marks for the process),
- correctly converting the dimensions for the crate or the box and dividing the corresponding lengths but then adding the results rather than multiplying
- finding the volumes for both the crate and the box but dividing box by crate instead of vice versa.

Learners who tried to convert units of volume after finding the volume of the crate or a box often used the incorrect conversion.

Question 14

A good number of this cohort gained 4 marks on this question and a variety of processes were seen in achieving this. The most common process seen was to find the total pay for Monday to Friday and find the rate of pay per hour for the weekend and therefore total pay for Saturday and Sunday, and then add these two together. A common error seen was to incorrectly calculate $8 \times 1\frac{1}{2}$ as 4, presumably coming from incorrect use of the calculation, writing $1\frac{1}{2}$ without using the mixed number button, or from reading it as one half of 8. Another common error was to work out the weekend rate of pay as 8 + 8 + 4 = 20. The majority of learners could find £240 for the weekdays and then were not sure how to deal with the rate of pay for Saturday and Sunday. It is also evident from this real life question that learners are not familiar with pay rates.

Question 15

Part (a) saw varied success as many of this cohort were not able to gain 3 marks. For those that didn't, it was common to see learners unable to make a correct start at all, often finding the sum of the ages column and dividing this by 5, as well as dividing 41 by 5. Some learners successfully found the sum of the products as 406 but divided by 5 instead of 41. Some learners began with the correct method and then started a different, incorrect method and pursued this to gain 0 marks. Part (b) saw more success, with a good number of learners gaining 1 mark for an acceptable example as listed in the mark scheme or something equivalent. The most common incorrect answers were those listed in the mark scheme under not acceptable examples.

Question 16

Part (a) saw a good number of learners score 2 marks for a correct answer. Of those that didn't, it was common to see an incomplete factor tree (e.g. one that does not have prime numbers at the bottom of the branches) or a lack of understanding as to what is meant by prime factors. Part (b) saw 0, 1 and 2 marks awarded in almost equal measure. Of those that did not gain 2 marks, many gained 1 mark, usually for correctly identifying the prime factors of 210 or for an answer in the SCB1 list (2, 3, 6, 7, 14, 21). Some learners found the Lowest Common Multiple by listing multiples, gaining 0 marks.

Question 17

This question saw 0, 1 and 2 marks awarded in almost equal measure. For those that did not gain 2 marks, there were a number of ways (detailed in the mark scheme) that learners could gain 1 mark and all were seen regularly. It should be noted that frequency polygons require points to be joined with line segments – it was often seen that learners would plot the correct points but join with a curve, gaining 1 mark, centres should encourage learners to use a ruler. It was also the case that if two errors were made this would be 0 marks, for example the learner that plotted the points at the end of the intervals (e.g. 140, 160, 180, 200, 220) and joined the first and last point directly gained 0 marks. Regularly it was seen that points were not joined together when drawn at consistent intervals and gained 0 marks. Many learners drew histograms and gained 0 marks.

Question 18

Part (a) was answered well with a large proportion of the cohort able to give a correct answer. Part (b) saw less success with very few correct answers seen; common incorrect answers included 8.026×10^n where n was incorrect, often given as −4, and 0.8026×10^n was also seen.

Question 19

It was rare to see a correct set of relevant arcs drawn as most learners did not know how to begin their answer. Some learners were able to produce a bisector within the allowed tolerance without the relevant arcs, gaining 1 mark.

Question 20

Part (a) saw some success with a good number of learners gaining 2 marks for correctly completing the tree diagram. Of those that didn't, many gained 1 mark for correctly filling out the branch for Game 1, but made errors on Game 2 branches such as mixing up the order of 0.3 and 0.7. In part (b) many did not understand the need to multiply the 2 probabilities and instead added or simply gave their answer as 0.7. If a learner did not have correct probabilities in (a) they could still gain 2 marks on the follow through in (b) and this was seen on occasions.

Question 21

This question saw the full range of marks awarded. It was rare to see a fully correct solution. That being said, it was common to see 2 or 3 marks awarded and these could be gained in a variety of ways. Those that worked with the ratio usually gained at least the first 2 marks and possibly the third mark for either the cost to buy or amount to sell for both or the profit for one item. If a learner was not able to work with ratio, the mark scheme still allowed them to gain up to 3 marks using their values of the number of pens and the number of pencils. It was rare to see learners gain the 4th P mark and it is clear this cohort needs to work on percentage profit and finding one amount as a percentage of another in general. A common error was to reach 2490 and 1710 but divide the wrong way round when attempting to find the percentage profit.

Question 22

This question saw the full range of marks awarded. Some learners managed to gain 3 or 4 marks, usually for two correct values for median and range and at least one correct comparison. It should be noted that simply writing the value of two medians or ranges is not enough for comparison, some sort of statement relating to their sizes like the two examples in the mark scheme is required. Some learners used a method to find the median from the stem and leaf diagram but failed to extract 57 from it, leaving the 7 circled, which was not enough to gain B1.

Question 23

This question saw very few learners scoring 2 marks. Some were able to gain one correct limit, usually 10.2. There were a variety of incorrect answers with 10.15, 10.25 being the most common.

Question 24

Some were able to work with trigonometry correctly, those that produced a correct trigonometric statement or equation generally went on to gain 2 marks; a small number had the correct method but prematurely rounded their answer to 14, without first seeing an answer in range this was awarded M1A0. Many attempts to use Pythagoras were seen.

Question 25

Although part (a) saw mixed results, it was pleasing to see some learners pick up 2 marks at this stage of the paper. Some gained B1 as they were not able to simplify all 3 terms but managed to do so with 2 terms; the y power as 5 instead of 6 or the coefficient as 9 instead of 14 were often seen. Many learners were not able to give an answer in the correct form e.g. some gave their answer as an addition, whereas others appeared not to be able to make any sort of correct start. Some that got the three terms correct only gained B1 due to the inclusion of multiplication signs. Part (b) saw a good number of this cohort able to gain B1 with a correct answer. That being said, many were not able to simplify the powers correctly; common incorrect answers were m^{-1} and m^5.

Question 26

A small number of learners were able to gain 3 marks for a correct answer for the value of interest after 3 years. Of those that didn't, it was common to see 1 or 2 marks awarded. For those that gained 2 marks, it was usually for reaching 4747.4... but failed to subtract 4500 to work out the interest. Those that gained 1 mark usually found the value of the investment or interest after 1 year or worked with simple interest and gained SCB1 for 243 or 4743. A good number of the cohort gained 0 marks with a variety of incorrect methods seen.

Question 27

It was very rare to see learners making much progress with this question. Those that gained 1 mark usually produced an equation with a value of c as 3. Many learners did not know how to start the method and simply wrote down pairs of coordinates such as $x = 1.5, y = 3$.

Summary

Based on the performance on this paper, learners should:

- learn the names of special quadrilaterals and their associated properties
- practise reading scales for axes on graphs
- work with the given information in the question and not include further interpretation of their own
- work on calculator skills, including the use of the mixed number button
- understand that a frequency polygon requires the points to be joined with line segments, not a curve
- work on percentage profit and finding one amount as a percentage of another in general
- practise finding the equation of a straight line from a graph
- practise finding an angle bisector
- show complete mathematical methods e.g. $\frac{2}{5}$ of 200 or 35% of 80 are not credit worthy unless seen with an accurate result
- be encouraged to use rulers with graphs such as frequency polygons