AQA
Realising potential

GCSE
Mathematics

8300/1F: Paper 1 (Non-calculator) Foundation

Report on the exam

November 2021

Contents

Summary

Overall performance compared to last year

The performance was similar to November 2020.

Topics where students excelled

- pictograms
- working from a given calculation to find answers to related calculations
- multiplying a decimal by 100
- simplifying an expression
- multiplying two terms that contain indices

Topics where students struggled

- rotational symmetry
- using symmetry to work out coordinates
- factorising a quadratic equation
- trigonometry
- inequalities

Multiple choice questions

Which questions did students find most accessible

Questions 1 and 10 were the best answered multiple choice questions, showing a good understanding of multiplying a decimal by 100 and how to identify the final digit when calculating using long multiplication. Questions 2 and 3 were the two questions that the most candidates attempted.

Which questions did students find least accessible

Questions 21 and 29 were less well attempted. Question 29 had a fairly even spread of choices made by students, whilst Question 21 had d as the most common, incorrect answer.

Questions 30 and 26 were the two questions that the fewest candidates attempted.

Common misunderstandings

Question 26

Most students misread the diagram and took the lines of $y = 5$ and $x = 1$ to be the x and y axes.

Individual questions

Question 5

This question was well attempted with the students knowing that 8 x 5 gives 40 and in the main, remembering to include the negative sign. Common wrong answers apart from just 40, were 0.4 and –45.

Question 6

Most candidates successfully calculated the cost of 4 apples although occasionally the number of apples was miscopied, and candidates worked out the cost of 5 apples. If they began this question in this way, they were still able to access all of the method marks.

Candidates often obtained the correct cost of 5 bananas and attempted to divide by 5 to find the cost of one banana but arithmetic errors in the division often meant that the correct answer 46p was not reached. The method of repeated subtraction to find the cost of the 5 bananas was rarely seen but after £2.30 was found, build-up was a common method used, to try and get to the price of a banana. A common error was to work in £ and get £2.30 resulting in an answer £0.46. If this was the answer given, the final mark was lost for expressing the answer in the wrong units. The question asked to work out the cost in pence.

Question 7

Students demonstrated a secure understanding when completing the pictogram in part (a). The only error seen was a rare 1½ symbols drawn in. Many pupils were correctly able to calculate the number of pieces of homework for each subject, in part (b), but did not go on to find the total number of pieces of homework. The pupils that calculated the total time taken (1170 minutes) often did this correctly, but many were unable to correctly convert this into hours and minutes (1170 minutes often became 11 hours 7 minutes). The most successful method was to work out the total number of minutes per subject before adding and converting.

Question 8

Most students calculated that they needed enough seats for 159 people. From there, roughly equal numbers of students built up to 156 in 12s as used the standard method of dividing 159 by 12. The majority of candidates understood the need to round up from a remainder.

Question 11

Rather than rotating the shape given, the majority of candidates reflected it, both vertically and horizontally to get 4 shapes. There were attempts at rotations of 180° or ±90° but the triangle still ended up in the wrong orientation.

Question 12

Students were often seen correctly calculating 40% of 2100 by using the given value for 10%. Finding 1% of 2100 usually did not have a method shown and was often associated with an incorrect value. Some students chose to work with the 2100 and find 43% directly. Use of this method was mainly unsuccessful, due to the larger nature of the numbers involved.

Question 13

Many of the criticisms that were seen were referring to time frames or stating that tally and frequency are the same thing. The most common, correct criticism was to notice that there was no row in the table in which to put 53 or 57. Many students however, offered ways to fix the table, rather than offering criticisms of the table.

Question 14

Many students were able to find the correct answer by adding 0.15 and 0.4 to find 0.55 and then subtracting this from 1 to find 0.45, however, a significant number of students added 0.15 and 0.4 to get 0.19 and then subtracted this from 1 to get an answer 0.81. The other commonly seen error was students only attempting to add 0.15 and 0.4 failing to subtract their answer from 1.

Question 15

Part (a) was extremely well answered, with students using the given calculation in reverse. The students who attempted the actual division, were usually unsuccessful.

Part (b) was very well attempted but the correct decimal placement proved to be quite difficult for students.

Part (c) saw the most common method being to start a long multiplication calculation. This was very often, successful, but was a longer route than realising to just add 31 to the number given at the start of the question.

Question 16

The 10 (symbols) was usually correctly calculated, leading to the correct, unsimplified ratio, 5 : 10 : 15

Many students then did not attempt to simplify the ratio.

A common mistake was to put the three numbers in the ascending, numerical order; if this occurred the final mark for simplification was still available.

Question 17

This addition of fractions questions was not well answered, although it was well attempted. The most common, incorrect answer was $\frac{5+7}{6+12} = \frac{12}{18}$ which resulted in no way to gain the B1 on follow through, as this isn't an improper fraction. The other common, incorrect answer was to correctly get the $\frac{10}{12}$ but then to mistakenly double the 7 as well.

Question 18

In part (a), the most common answer was 60p.

Part (b) saw many attempt to divide 60 by 5, not understanding that the 60p wasn't just the cost of the 5 minutes. There were a few attempting to find the difference in cost between successive numbers of minutes, some of which were successful, some of which were not; it was a fairly even split.

For part (c), the most common method was to multiply their answer to part (b) by 7, which did not take into account the standing charge and could therefore not score. The more successful candidates were those who attempted to extend beyond the 60p for 5 minutes, rather than start again for the total cost of a call lasting 7 minutes.

Question 19

The majority of students were using a correct method to identify a median. It was only the weaker candidates who did not realise ordering was necessary and gave an answer of 47 which was the middle value from the list given in the question.

When ten bags of mints were considered, many candidates identified the middle values 48 and 50 but did not always correctly state that the median was 49. Without stating a single median for toffees and mints, candidates could not gain the final two marks.

Correct decisions were not always made, once two medians had been calculated. It's possible that some candidates misinterpreted "at least 50" to mean "more than 50".

An error made by a small number of candidates was to only use distinct values. This meant the question became easier with only 7 values for toffees and 6 values for mints being considered.

Question 20

In the main, the 9.82 was correctly rounded, but students felt comfortable adding up the values on the numerator either as given, or rounded to one decimal place, before dividing by the 10.

Question 22

In part (a), although some students answered No and gave the correct reason as $8a$ - $7b$, many candidates did not appreciate that multiplying a negative by a negative gives a positive answer in this question. Consequently, they thought that 4a was correct when it should have been 8a. Some students also changed -7b to +7b again incorrectly.

In part (b) for those who did not answer correctly, there did not appear to be any one combination that was the most common.

For part (c), the most common, correct answer was 1, rather than -1. Common wrong answers seen included 10, 0 and 100.

Question 23

Many candidates were able to convert years and months to just months and therefore scored the first mark. Most candidates attempted to write the months as a fraction, although some had their fraction upside down. Some candidates were unable to fully simplify their answer. The most common, incorrect answer was $\frac{5}{7}$.

Question 24

A good number of candidates understood that it would not take 8 hours, but were unable to give a valid reason as to why that would be. Many calculated the actual time that it would take, incorrectly, because they halved the 4 hours and not the 8 hours. Candidates that mentioned Steve not working at the same rate were unable to score, since the question stated Kevin and Steve would work at the same rate, as part of Kevin's statement.

Question 25

Students struggled with the algebra on this question, trying to add $3x$ to $5x$, or add 6 to 15. For those who processed the moving of terms correctly, they often stopped when they reached $2x > 9$, instead of continuing on to find an inequality with x as the subject.

Question 26

Most students mistakenly thought here, that the centre of the octagon, was at (0, 0). This resulted in the most common answer being given as (2, 6).

Question 27

In part (a), many candidates were able to score the method mark for correctly multiplying 2000 and 70 000. Often. this did not lead to an attempt at an answer in standard form or was given as 1.8×10^7. It was very rare to see students converting the given numbers into standard form, to work through the question in that way.

In part (b), the intermediate value that was most often calculated correctly was the 180. Often the 0.3 was given as –3, –30 or 29 (coming from $3 \times 10 - 1$). It was very uncommon to see a wholly correct answer. The approach of working out the top number, followed by the bottom number, followed by a division was more successful at gaining students a mark, because dealing with the powers of 10 often ended with 10^1.

Question 28

Many candidates did not understand that they needed to work out the distance from A to C and rather than calculating the distance travelled in 30 minutes by working out 62 ÷ 2 or 62 × 0.5 they tried many combinations, such as 62 ÷ 30 or 62 × 30. Only the very able candidates obtained 31 and went on to realise 31 – 25 was needed to find the distance AB, so that the distance from C to D could be worked out.

Even when the correct values 31, 6 and 18 were found and 25 was given in the question, the final answer for the distance AD was not worked out correctly, with combinations of these numbers calculated. e.g. 31 + 25 + 18 + 6.

Some candidates thought the diagram was to scale and estimated the value of AB to be 5. They then went onto give CD as 15 but this attempt did not gain them any marks.

Question 30

A pleasing number of students knew how to start off by creating a factor tree or by doing repeated division. After a good start, the most common, incorrect answer was $2^3 + 5^2$.

Question 31

Those students who tried to use trigonometry to solve this question, frequently calculate the correct answer. Many did not remember that sin 30 = 0.5 therefore got no further than sin 30 = $x \div 10$ or x = 10 sin 30.

Some students realised that you could form an equilateral triangle with 60° angles and that the three sides were all 10, leading to the correct answer by finding 10 ÷2 = 5 without using trigonometry.

Question 32

Only a small number of students attempted the factorisation required here. The most common answers seen were $(x + 7)(x + 10)$ and $x(x + 7) + 10$.

Further support

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