

GCSE

Mathematics

8300/2F: Paper 2 (calculator) Foundation

Report on the exam

Published: November 2023

Contents

The below table is interactive. You can press the control button click on the title of the question to go directly to that page.

Contents	Page
Summary	3
Individual questions	4
Further support	10

Summary

Overall performance compared to last year

Students were able to make an attempt at most of the questions, although they did struggle with the last few questions that were common with the Higher tier. Some students did not set out their solutions clearly and numbers were often written ambiguously. Throughout, some students had a tendency to convert fractions to an approximate decimal which meant accuracy in the final answer was lost.

Topics where students excelled

- Subtraction of directed numbers
- Solving a simple equation
- Fraction to a decimal
- Number puzzle
- Conversion graph
- Writing a ratio
- Best buy problem

Topics where students struggled

- Best average
- Randomness in probability
- Similarity
- Describing a rotation
- Bearing
- Term-to-term rule
- Equation of a line given two points

Individual questions

Question 1

Many correct answers were seen. 8000 and 80 were the most common wrong answers.

Question 2

This question was very well answered. -16 , 16 and 6 were the common errors.

Question 3

Part (a) was mostly correct with very few incorrect answers and just the occasional miscount to 70%.

Part (b) was less well done. 5% (the number of squares) and 10% were the common incorrect answers.

Question 4

Part (a) was well answered. Some students had a correct embedded answer but then selected 6 as their answer. Others gave 2 or 3 as their answer.

Part (b) was even better answered. Some had an embedded correct answer and then selected 24 or 27.

Question 5

This question was well answered but the common incorrect answer was 2.1

Question 6

When completing the statement many students gave the correct first value but some deducted the refund. Occasionally students also deducted the wages. Students who made an error were often able to follow through correctly. Some students attempted to complete the shaded cells and usually this meant they gave incorrect answers. There was a high proportion of non-attempts perhaps suggesting that students were not familiar with the bank statement format.

Question 7

Generally students used the given numbers and many had at least three of them in the correct positions. Some students only checked that the rows made 120 and did not realise the columns were incorrect. The most common error was to interchange the 4 and the 10 in the top row. Others gave the 6 and the 20 the wrong way around, and some made both of these errors leaving only the 5 correct.

Question 8

Both parts were extremely well answered. Some students misread the vertical scale in part (a) so read from 740 and gave the answer 62.

In part (b) the majority of students attempted to scale up from the reading for £100 and the most common incorrect method was to multiply 1200 (the reading for £100) by 500 and give an answer of 600 000.

Question 9

In part (a) most students rounded at least one of the numbers correctly. Some students added the original values and then rounded. Occasionally students rounded to 1 significant figure throughout.

In part (b) some students talked about rounding to the nearest 10 or gave the general rule for deciding what to round. However, many students did refer to both the original numbers and said they had increased.

Question 10

In part (a) some students gave the median or the mode and occasionally students worked out the range. However, most attempted to add up the numbers and divide by 6. Often one of the modal values was omitted by accident or a number was misread. A few students did not use brackets in their calculation so gave an incorrect answer. Although a comma is accepted in place of a decimal point, the reverse is not acceptable.

In part (b) many students talked about the three matching salaries or stated the mode would be better but without mentioning the mean. Some talked about the large range affecting the mean or even recommended the range. It was common to say that they were all different from the mean. The most common correct answers mentioned that 99 000 was much larger or an anomaly or said that only one salary was higher than the mean.

Question 11

Most students managed to make a start and correctly work out her mass as 121 pounds. It was common to see students going on to work out that this was 8.6 stones but then to give the answer in stones and in pounds, ie 8.6 stones 121 pounds. Occasionally students converted 8.6 stones to 8 stones 6 pounds. Students who started by dividing by 2.2 made no further progress.

Question 12

In part (a), those who scaled up usually gave the answer 480, the amount of stock. A substantial number of students divided by 6 or by 7.

The common wrong answer in part (b) was $\frac{1}{14}$ but most did give a fraction.

Question 13

Many students were able to give one correct term in part (a). Some did not go on to form an equation or gave their answer as an inequality. Many students left their terms in an unsimplified form such as $y \times 6$ or $y6$. $15y$ was commonly seen for $y + 15$ and sometimes $6y$ was seen embedded in $6y + 15$.

Part (b) was often correctly answered by referring back to the original question rather than using their equation. This was generally done well but a few simple arithmetic errors were seen.

Question 14

This question was well answered with many fully correct solutions. Occasionally students omitted one of the costs and sometimes they only included one game of golf per person. Working out the number of minibuses tripped up some students and those who divided and worked out 2.8 sometimes did not round up their value. A number of students worked out the total cost rather than the cost per person. Those who worked out the cost per person of each item from the start often lost accuracy through premature rounding.

Question 15

Most students attempted a relative frequency and gave the answer $\frac{4}{9}$ or $\frac{4}{10}$. Occasionally the answer was given in words or as a ratio.

Question 16

This question was very well answered. Occasionally 2 : 8 was seen.

Question 17

Part (a) was well answered.

However, part (b) was poorly answered and many students drew a congruent rectangle or drew a rectangle stretched in one direction. A 3 by 5 rectangle was a common incorrect answer from adding 1 cm to each dimension.

On questions such as this, where the student response has to be written on the gridlines, we produce a relatively faint grid to enable the student response to be seen as clearly as possible. We would like to advise centres to be mindful, if producing their own copies, especially on coloured paper, of ensuring that the grid is visible when printed. In response to a very small number of centres getting in touch about grids that were difficult to see, we checked all scripts where images were causing difficulty to ensure that no students were disadvantaged.

Question 18

In part (a), students often found the two-way table difficult to navigate and a common error was to put 4 in the top right cell which gave $\frac{4}{9}$ of the total of the soft. 16 was also commonly seen in that cell. Quite frequently the left-hand column was completed with 10 and 5 attempting to meet the twice as many milk as dark criterion, but this only addressed the hard centres. Sometimes 11 was the only correct value in the table.

Part (b) was not always completed and some tried to use their total rather than the 36 that was given in the question. $\frac{1}{5}$ and $\frac{5}{16}$ were also regularly seen.

Some students gained the follow through in part (c) or had the correct probability even if their table had gone awry. However, there were quite a few non-attempts and some gave their number of dark chocolates with hard centres as a fraction of 36.

Question 19

This question was poorly answered. Most students referred to translations or vectors or reflections and these were sometimes combined with a mention of rotation. Many did not use the correct vocabulary so turn and flip were frequently seen. Some did manage to work out the 180° . It was rare to see the centre of the rotation stated, although some wrote 'centre' but with no reference to the origin.

Question 20

Most students did square both sides, although sometimes they multiplied the values. Some students gave the answer as 462.25 or went on to square that. There were some arithmetic errors seen which meant that the answer appeared correct but came from rounding. Weaker students simply added the sides or used angle values. Despite the instruction to use Pythagoras' theorem, a few students attempted to use trigonometry.

Question 21

This was very poorly answered with few students working out the angle as 79° and even fewer writing it as a 3-figure bearing. It was common to see students adding the given angles but then subtracting from 360° , 180° or 90° .

Question 22

The common incorrect answers were 6 (the number of vertices), 5 (the number of sides) and 8. Some students drew a diagram to help, although it was clear from these that not all students knew what a triangular prism looks like.

Question 23

Students were able to make good progress in this familiar style of problem-solving question. A large number gave fully correct or almost fully correct solutions with a few just making an arithmetic slip or selecting the wrong answer.

Not all students understood the idea of 'Buy one, get one half price' for shop B and some had them all at half price or seven at full price and one discounted.

For shop C, some students used 0.16 for $\frac{1}{6}$ and lost accuracy. Many students worked out the discount for one or two packs and thought this was the total cost. Weaker students simply subtracted $\frac{1}{6}$ from £11.40.

Question 24

A lot of students did not know how to work out the area of a trapezium and many added or multiplied the three dimensions. Students often completed the calculation by dividing by their area rather than multiplying. It was common to see students stating an incorrect area and not showing the method they had used and they should be encouraged to always show their working.

Question 25

Students found part (a) challenging and all the other options were popular.

In part (b), the majority of students thought the calculation was correct because it equalled 20 and did not realise that multiplying by 100 rather than 360 would give a percentage rather than an angle. Those who realised that 360 should have been used often thought that it was the 180 that was incorrect.

Question 26

Very few students knew how to work out the volume of a prism and this was very poorly answered. Some did copy area of cross section \times length from the Insert but did not know how to apply it. Most multiplied different values together and some combined areas and volumes. It was common to see responses which involved the addition of the dimensions or multiplied more than three edge lengths. Some students gave incorrect dimensions through counting the dots on the isometric grid. A few attempted to measure the diagram.

Question 27

Some students were able to work out the 135 miles for the first part of the journey and some worked out the second part took 2 hours. However, many combined speeds and distances incorrectly. The weaker students chose a value between 31.5 and 45 miles per hour, with some working out the average of these two values.

Question 28

There was a large proportion of non-attempts. Those who attempted the question rarely went beyond trying to work out the fourth term. Many of the terms were incorrect with $8a + 26$, $8a + 19$ and $6a + 29$ all seen frequently. Students who had a fourth term, frequently only substituted values. Those who evaluated the sum of the first four terms usually only considered the terms in a or the constant terms but not both.

Question 29

Most students did not attempt this question. Those who did usually combined the coordinates from the same point rather than pairing up the y -values and the x -values. Occasionally students worked out 9 and 18 but this often gave an answer of $y = 9x + 18$ or a gradient of 0.5.

Further support

Mark ranges and award of grades

Grade boundaries and cumulative percentage grades are available on the [results statistics](#) page of our website.

Enhanced Results Analysis (ERA)

Use our exam results analysis tool to create and customise as many different reports for comparison as you like.

Professional development

Attend one of our feedback [courses](#) where you can review example responses from students and commentaries from our examiners.

Contact us

Our friendly team will be happy to support you between 8am and 5pm, Monday to Friday.

Tel: 0161 957 3852

Email: maths@aqa.org.uk

aqa.org.uk