AQA

# GCSE

# Mathematics

8300/2F Paper 2 Foundation

Report on the Examination

8300

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**General**

There was no evidence of time pressure with most students able to complete the whole paper. The majority of students were able to access most of the questions and were rewarded for good use of mathematics shown at different levels of ability. Students did not always show working when instructed to do so. It was apparent at times that some students did not use a calculator. Students need to try to write their digits clearly as some of their answers were ambiguous.

Topics that were well done included:

- discount problem
- word formula
- pictogram problem
- listing outcomes
- simplifying expressions
- type of correlation.

Topics which students found difficult included:

- rotational symmetry
- using equivalent ratios
- using a scale diagram and changing scale
- understanding extrapolation
- surface area problem
- equating coefficients in an identity
- bearings.

**Question 1**

This question was well answered. $4a$ was the most common incorrect choice.

**Question 2**

This question was well answered. 5 and 19 were common incorrect choices.

**Question 3**

This question was very well answered. 2h 25 min was the most common incorrect choice.

**Question 4**

This question was less well answered. The square was the most common incorrect choice.

**Question 5**

Part (a) was very well answered, although some students subtracted the first value from the last value to give the answer 10. In part (b) the majority of the students ordered the data but many then chose 5 or 9 as their answer or combined the two values incorrectly. A significant minority of students worked out the mean.

**Question 6**

This question was very well answered. Almost all students were able to work out the discounted cost for Amara or Bobbi and a large number gave a fully correct solution. Some students lost accuracy when working out the discounts due to poor arithmetic. Very occasionally students only worked out the difference between the costs without any discounts.

**Question 7**

Part (a) was accurately solved by the vast majority of students, although some gave the answer 5. Part (b) was also usually solved correctly but some students divided 12 by 4.

After the examination, a printing issue was discovered in part (c). A proportion of students had papers with a small gap on the answer line, leading some to think that two answers were required. We considered this before marking started, and determined that the question was not of the same demand if students had thought they needed to provide two answers. Consequently, we chose to discount the question and award every student 2 marks.

**Question 8**

This question was very well answered. £30 was the most common incorrect choice.

**Question 9**

Most students were able to state the correct proportion of shaded squares, however some did not link the 10 shaded squares with the total number of squares. In general students were able to correctly convert their proportion to a percentage.

**Question 10**

This question was extremely well answered. Occasionally students were unsure how to deal with the half-circle.

**Question 11**

Almost all students evaluated one calculation correctly and most went on to give a fully correct answer. Those who attempted to combine both calculations with no intermediate evaluation often did not correctly use brackets so gave an incorrect response.

**Question 12**

This question was very well answered with most students giving a fully correct list. Occasionally repeated combinations were seen such as HB.

**Question 13**

This question proved to be a good discriminator and differentiated well between students. Most students were able to fulfil two or more of the measuring criteria. The angle for *QPS* was often incorrectly drawn. Some students tried to make the quadrilateral into a rectangle, a right-angled trapezium or a parallelogram.

**Question 14**

This question was reasonably well answered. Cuboid was the most common incorrect choice.

**Question 15**

The common approach was to convert the values to decimals and most students were correctly able to change at least one. Despite being able to convert the values, many students then chose $\frac{13}{10}$ as their answer. Some students made errors when calculating the difference from 1.

**Question 16**

Many students approached this question incorrectly by dividing 6 in the ratio 2 : 1 or 3 : 1. Those who correctly scaled the ratio 2 : 1 as 12 : 6, often went on to scale 3 : 1 to 18 : 6 which meant they had different values for B. Even those who worked out A : B = 12 : 6 and B : C = 6 : 2, sometimes included B twice in their total number of games. Students who set out their working in labelled columns were usually more successful.

**Question 17**

This question was very well answered. Some students matched the last expression to $5a$ rather than $5a^2$.

**Question 18**

This question was a good discriminator. It was common for students to work out 2 times and 3 times the amount of juice but then compare this with the total drink and say Rana had not followed the instructions. Occasionally students decided that they only needed to test 2.5 times the amount of juice as this is exactly midway between 2 and 3. Some students realised that the total drink needed

to be between 3 times and 4 times the amount of juice so worked out the relevant values. However, some of these responses suggested that they were not completely convinced of what their values showed.

**Question 19**

Most students gave two of the three correct answers with the majority selecting that the triangles are congruent and realising that the area of the rhombus is four times the area of a triangle.

**Question 20**

Part (a) was poorly answered with very few students able to combine any of the values correctly and even fewer able to link 1500 metres with 30 000 centimetres in a coherent way. Some students did give a correct partial calculation, usually 1500 ÷ 5, or a change of units.
In part (b) some students were able to measure *AC* accurately and then calculate the actual distance in centimetres or metres. Very few were able to write the actual distance in kilometres with many multiplying instead of dividing by the conversion factor. Weaker students stated the distance *AC* was 2 cm or 4 cm or 6 cm using the vertical distance or the number of squares crossed or the distance across and down. Some students assumed that $AC = AB$.

**Question 21**

An answer involving 9 and / or 15 was frequently seen. Some students gave a pair of prime numbers that were under 20 but it was less common to see one of the three possible correct answers.

**Question 22**

This question was poorly answered. A few students only worked out the volume or multiplied several sides and some students calculated perimeters. However, the majority of students were able to work out the area of one of the sides. Many combined the sides incorrectly or thought the four green faces were all the same size. Occasionally, students who worked out the correct areas did not state a conclusion or just circled the larger area without stating blue was larger.

**Question 23**

Most students were able to work out the relative frequency of draws and many gave this as their answer. Those who knew to multiply this by the number of games usually gave a fully correct solution. Some students subtracted the percentage of wins and losses from 80, the number of games.

**Question 24**

Some students only gave a list of factors, often in pairs. Those who attempted to work out a factor tree, usually managed to do so correctly although often then went on to give the HCF or a factor as their answer. Students who gave lists of multiples usually went on to find the LCM.

**Question 25**

Part (a) was very well answered but occasionally students tried to describe the relationship rather than give the type of correlation. In part (b) the majority of students drew a straight line with a positive gradient although it often went through the origin. Some students had problems interpreting the different scales on the axes. A significant minority of students thought that they could read the value off the graph without using a line of best fit despite the instruction to use one. Part (c) was poorly answered. Many students were unable to articulate an unambiguous answer and often it could apply to interpolation as much as extrapolation. Some students were concerned that being good at the high jump does not make you good at the long jump.

**Question 26**

The majority of students were able to start a solution to this problem. Those who worked out the speed for stage 1 in miles per hour sometimes went on to work out the time for stage 2 in hours but then incorrectly converted that to minutes. Students who worked out the speed for stage 1 in miles per minute usually then multiplied this by 44. A successful build-up method that involved realising that the rate was 11 miles in 12 minutes was often used for a fully correct solution. However, there were many incorrect build-up attempts with insufficient working seen.

**Question 27**

This question had a very high proportion of non-attempts. The majority of students attempted to multiply out the brackets and then rearrange the terms as if solving an equation. It was very rare to see students equate coefficients.

**Question 28**

A high proportion of students did not attempt this question. The first step of finding the base angle of the isosceles triangle did prove very accessible. However almost all students then simply subtracted that value from 360 to get their answer. The other common error was to add the 62 and the 56 but go no further.

**Question 29**

A large number of students identified the fact that the sequence was increasing by 4 and either stated the difference or showed the 4th or the 7th term. A large number went on to work out the 10th term but then multiplied this value by 10. Some did work out that the 100th term was 94 terms beyond the 6th term and correctly evaluated $94 \times 4$ but then did not realise that they needed to add on the 6th term. Those who correctly identified the $n$th term usually gave a fully correct solution. However it was common to see the calculation $4 \times 100 + 1$. Some did attempt to build-up to the answer term by term but almost always made an arithmetic error at some point.

**Question 30**

There were two common incorrect approaches to this question. The first was to assume that the vectors were fractions and to work out $3 \times \frac{2}{7} - \frac{5}{2}$. The other was to think that **a** = 9 and **b** = 3. Some added the vectors and then multiplied by 3 and others only multiplied the 2 in **a** by 3. Students fairly often put a fraction line in the final answer even when the values were correct.

**Question 31**

The vast majority of students used simple interest but some still went on to give their answer to 2 significant figures. Those who used compound interest often worked year by year and sometimes made an error, however they often did not show their method. Students with an accurate value using compound interest frequently rounded incorrectly or forgot to round at all.

**Mark Ranges and Award of Grades**

Grade boundaries and cumulative percentage grades are available on the Results Statistics page of the AQA Website.