

**GCSE (9–1)**

**Examiners' report**

# **MATHEMATICS**

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**J560**

For first teaching in 2015

**J560/05 Autumn 2021 series**

## Introduction

Our examiners' reports are produced to offer constructive feedback on candidates' performance in the examinations. They provide useful guidance for future candidates.



Reports for the November 2021 series will provide a broad commentary about candidate performance, with the aim for them to be useful future teaching tools. As an exception for this series they will not contain any questions from the question paper nor examples of candidate responses.

The reports will include a general commentary on candidates' performance, identify technical aspects examined in the questions and highlight good performance and where performance could be improved. The reports will also explain aspects which caused difficulty and why the difficulties arose, whether through a lack of knowledge, poor examination technique, or any other identifiable and explainable reason.

A full copy of the question paper and the mark scheme can be downloaded from OCR.

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## Paper 5 series overview

J560/05 is a non-calculator paper and is the second paper in the Higher tier of the GCSE (9-1) Mathematics specification.

There was a small entry for the November paper with many more candidates taking the Foundation option rather than the Higher option. There was a range of marks with most candidates able to access the majority of the paper. A larger number of more able candidates were aiming for the higher grades 7 to 9 than in previous November resit sessions after a June examination.

Work was generally well presented but a few candidates chose unstructured approaches in their working to some of the problem solving questions like Q11 (problem solving with trigonometry), where a more structured approach would have benefitted.

On questions involving diagrams, such as Q11 and Q18, those candidates that annotated the diagrams to support their working and answers had more success; they were able to clearly identify lengths and angles they had calculated as part of their working.

The questions that were generally answered well included plotting points on scatter diagrams and describing correlation, drawing algebraic graphs, finding the range from a box plot and converting fractions to recurring decimals.

The questions that candidates found more challenging included negative indices, limitations of extrapolating with lines of best fit on a scatter diagram, solving inequalities and representing them on a number line, reasoning with statistics, similarity and volume, equation of a circle, problem solving with formulae and problem solving involving arcs and sectors.

<i>Candidates who did well on this paper generally did the following:</i>	<i>Candidates who did less well on this paper generally did the following:</i>
<ul style="list-style-type: none"> <li>• had a breadth of knowledge across the curriculum</li> <li>• had secure arithmetic procedures when calculating with ratio, fractions, decimals, and percentages and when estimating showed concise well-structured working.</li> </ul>	<ul style="list-style-type: none"> <li>• had a weaker curricular knowledge</li> <li>• used unstructured working on multi-mark questions</li> <li>• were less secure with their arithmetic when performing calculations involving ratio, fractions, decimals, and percentages.</li> </ul>

## Common misconceptions

Answering Q7(a), solving inequalities, many candidates either gave a value as the answer rather than an inequality, or when dividing by a negative term did not change the direction of the inequality symbol.

In Q8(b), many candidates either did not join the plotted points or joined them with ruled lines. A few joined the two branches of the graph together demonstrating an unfamiliarity with the shape of this graph function.

Answering Q10, some candidates tried to complete long decimal calculations instead of making an estimate by rounding the values to 200, 4 and 5 which would have made for a very straightforward calculation. Looking for key words in the demand of the question like 'estimate' should guide candidates to round values in the calculation appropriately.

Most candidates did not realise in Q14 that a volume scale factor should be used and that this is the length scale factor cubed. It was very common to have an answer of 100 from  $50 \times 2$ .

## Key teaching and learning points – comments on improving performance

On questions where a diagram is provided, annotating the diagram with values during intermediate steps of the calculation is a good way of communicating particularly when working with angles and lengths. In Q18 for example, this enabled the examiner to consider follow through marks for the ratio calculation in cases where angle BCD was incorrect but clearly indicated on the diagram with a value that could be used.

When solving inequalities, candidates should always give their final answer as an inequality unless directed otherwise in the question.

In questions that refer to mathematical similarity, candidates should consider the relationship between length scale factors, area scale factors and volume scale factors before attempting calculations.

## Guidance on using this paper as a mock

This paper can be used with confidence as a mock exam. When marking, teachers should be aware of the general guidance at the front of the mark scheme as well as the detailed guidance for each question. In particular, candidates may approach a problem with an alternate method other than that detailed on the mark scheme. In these cases full credit should be given for alternate correct approaches.

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# Supporting you

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