

**GCSE (9–1)**

**Examiners' report**

# **MATHEMATICS**

**J560**

For first teaching in 2015

**J560/01 Autumn 2020 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 Autumn 2020 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 answers.

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.

### Would you prefer a Word version?

Did you know that you can save this PDF as a Word file using Acrobat Professional?

Simply click on **File > Export to** and select **Microsoft Word**

(If you have opened this PDF in your browser you will need to save it first. Simply right click anywhere on the page and select **Save as . . .** to save the PDF. Then open the PDF in Acrobat Professional.)

If you do not have access to Acrobat Professional there are a number of **free** applications available that will also convert PDF to Word (search for PDF to Word converter).

## Paper 1 series overview

The majority of the candidates attempted most of the first half of the paper. A significant number of candidates did not make any attempt to answer the later questions, not realising they could have gained some of the marks.

Candidates are expected to use a calculator on this paper.

<b><i>Candidates who did well on this paper generally did the following:</i></b>	<b><i>Candidates who did less well on this paper generally did the following:</i></b>
<ul style="list-style-type: none"><li>• attempted all the questions</li><li>• showed their working</li><li>• set out their work in logical steps</li><li>• used mathematical instruments where appropriate.</li></ul>	<ul style="list-style-type: none"><li>• did not attempt the later questions</li><li>• did not show their working</li><li>• did not set out working to problem solving questions in a logical way</li><li>• did not use their calculator efficiently</li><li>• did not appear to understand how to do a construction</li><li>• did not appear to understand bounds</li><li>• did not read the question carefully to determine what was required.</li></ul>

## Comments on responses by question type

### Question 1

Most candidates scored all 4 marks. Several did not answer part (a).

### Question 2

Many scored all 4 marks. Candidates should be encouraged to use a ruler and a sharp pencil. Any incorrect lines should be neatly crossed out.

### Question 3

Many candidates were able to give the correct answer, although some confused volume and area.

### Question 4

There was a misconception in part (a) - see box below.

Part (b) was correctly answered by many candidates.

	<b>Misconception</b>	Candidates often associated 2% with 0.2.
-----------------------------------------------------------------------------------	----------------------	------------------------------------------

### Question 5

Many candidates were successful in correctly answering both parts.

### Question 6

Many candidates were able to answer parts (a) and (c) correctly.

Part (b) was more of an issue with the arrow being placed in various positions. Candidates need to make sure their arrows are accurately placed.

### Question 7

Although many candidates were able to give the correct answer, several divided 72 by 4 and then by 5 giving answers of 18 : 14.4.

### Question 8

Many candidates were able to divide 460 by 12 and get the answer 38.3... but rounded to 38, not realising they need an extra carton to pack all the yoghurts.

	<b>AfL</b>	When asked to round a number in a real-life situation, candidates need to consider if their answer is appropriate for that context.
-------------------------------------------------------------------------------------	------------	-------------------------------------------------------------------------------------------------------------------------------------

**Question 9**

In part (a) many candidates were able to correctly complete the Venn diagram. It should be noted that numerical values are needed, some candidates used dots or tallies.

In part (b)(i) many candidates were able to give the correct answer of 8, but some then did not indicate this on the Venn diagram for part (b)(ii).

There was a misconception in part (c) - see box below.

	<b>Misconception</b>	There was good understanding shown of using Venn diagrams, although there was a widespread misconception that the <b>total</b> number of dogs did not include the intersection.
-----------------------------------------------------------------------------------	----------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

**Question 10**

This question was attempted by most candidates and many scored at least one mark.

**Question 11**

Many candidates were able to score 1 mark, usually for  $50\ 000 \times 8$ , but some went no further than this. Candidates need to practice how to convert from one unit to another.

**Question 12**

In part (a) there was a misconception - see box below.

In part (b) errors were made in the order that candidates dealt with the terms; many attempted to move the 't' first. Another common error was failing to multiply the whole of the equation by 't'. There were also errors made in the sign when moving the 'v' to the left hand side.

	<b>Misconception</b>	In part (a), candidates assumed that $0.5\ \text{m/s}^2$ was the same as $0.5^2$ .
-------------------------------------------------------------------------------------	----------------------	------------------------------------------------------------------------------------

**Question 13**

It was rare for all candidates to score all 3 marks. Identity was not commonly known.

**Question 14**

Many candidates had set their work out in a clear and logical way, and several scored all 6 marks. Candidates should be encouraged to break these types of questions down into steps and show the working for each step in a methodical way.

**Question 15**

The correct answer was often seen in part (a).

Factorisation, in part (b), was not a topic which many candidates appeared to understand.

In part (c) many candidates did not realise they needed to use two pairs of brackets. This was the least well answered part.

**Question 16**

Common answers were 4.2 and 4.3. Many candidates did not attempt this question.

**Question 17**

In part (a) many candidates were able to correctly change a number from standard form to ordinary form.

In part (b) many candidates attempted to change the numbers into ordinary form but made errors in conversion. This question could have been done very efficiently on a calculator.

In part (c), several candidates did not attempt to find three times the value of Japan's production and simply compared the given values.

	<b>AFL</b>	Make sure candidates are familiar with the functions on their calculators and can use them to perform calculations efficiently.
-----------------------------------------------------------------------------------	------------	---------------------------------------------------------------------------------------------------------------------------------

**Question 18**

Many candidates did not realise they needed to use Pythagoras' theorem and confused sides with angles, adding the sides and stating they added to 48.4 not 180. Others incorrectly stated 'yes, it has two short sides and a long side'.

**Question 19**

A small number of candidates gave the correct answer. Many were able to score B1 for 0.18 but then did not attempt at the rest of the question.

**Question 20**

This question required careful reading and a logical approach and many candidates did this and scored 4 marks. Many attempted the question and scored 1 mark for 240 as the total. A common error was to find 60% of 95, the total for the third paper. A special case mark was given to candidates who did this.

**Question 21**

Very few candidates approached this question in a logical way. On questions such as this it is important to set out working logically.

**Question 22**

Many candidates gave the correct answer in part (a).

Part (b) was a 'show that' question meaning candidates needed to show how to reach the given answer. Some had drawn lines on the graph but had not added a comment to explain their lines.

The equation of a line was not a topic many candidates were familiar with in part (c). The response was often not in equation form while many others gave their answer in the form  $x = \dots$ . Despite having been told the gradient and having found the  $y$  intercept in the previous part the connection was not made that these should be used in the equation of the line.

Part (d) was not attempted by many candidates.

**Question 23**

Constructions are a topic which has regularly appeared on this specification, yet many candidates did not make any attempt at this question. Candidates should make sure they have the necessary equipment needed. Of those who did attempt the question, some had just drawn a line without any construction arcs.

### Question 24

Several candidates did not attempt this question, yet with careful thought and logic some marks could be obtained. Candidates needed to identify the number of faulty microwaves. Of those who attempted the question many scored 2 marks for answers of 9 or 10. The boxes were given to try to encourage logical work, however many still had working all over the page.

### Question 25

This was another question which need to be broken down into parts. The first mark was given for calculating the area of a square of side 36 m, but many candidates did not realise this was the starting point. Candidates then needed to calculate the area of 3 semicircles but this part was also beyond many candidates. For those who added their areas together the next step was to multiply their area by 30. However, some candidates divided by 30 or simply stopped at this point. Regular practice on these types of question will help candidates to develop strategies to solve part, if not all, of the question.

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

Candidates need to practise the longer questions and should be encouraged to attempt every question. Many did not attempt some of the longer questions. They need to break down the problem into parts and understand what is required for each step. On Question 25, some of the marks could have been gained had candidates attempted it. The first mark was for finding the area of a square of side 36; had there been a question which simply asked them to calculate the area of the square, more would have gained the mark. Encourage candidates to underline the key words in questions. A question of this type could be used as a starter activity. Regular practice at longer questions should improve candidates' performance. Work on methods, presentation and selecting the detail required to gain the marks.

Make sure that working is shown in order that method marks can be given. It should be made clear which work the candidate wants to be marked. It is acceptable to restart a question but unwanted work should be neatly crossed out. Where there is a choice of answer the poorer one will be marked.

Make sure candidates understand how to use their calculators, for example to calculate percentages and work in standard form. Mathematical instruments should be available for candidates. A significant number did not attempt the construction question, this was a standard question which required a ruler and a pair of compasses.

Make sure that candidates have a secure knowledge of mathematical vocabulary, such as equation, expression, term and identity. When solving equations there was very little rearranging of the equation. Substituting a value into the equation was by far the most common approach, but this leads to problems in developing algebraic skills. When rearranging the formula, errors were made in the order they dealt with the terms.

Candidates should be encouraged to attempt every question. If they are unable to answer a question they should still look at questions beyond the one they cannot do as they may be able to pick up some, if not all, of the marks.

Candidates need to be familiar with command words and phrases to know what type of response is required.

Work should be checked to ensure all questions have been attempted; several candidates did not attempt the first question. It should be realised that some work is done on grids or in tables and not every question has an answer line.

## Guidance on using this paper as a mock

Once the mock has been marked candidates will benefit from going through the paper in class, with the misconceptions being explained and strategies discussed for answering problem solving questions.

# Supporting you

## Review of results

If any of your students' results are not as expected, you may wish to consider one of our review of results services. For full information about the options available visit the [OCR website](#). If university places are at stake you may wish to consider priority service 2 reviews of marking which have an earlier deadline to ensure your reviews are processed in time for university applications.

## Active Results

Review students' exam performance with our free online results analysis tool. For the Autumn 2020 series, results analysis is available for GCSE English Language, GCSE Mathematics and Cambridge Nationals (moderated units) only.

It allows you to:

- review and run analysis reports on exam performance
- analyse results at question and/or topic level
- compare your centre with OCR national averages
- identify trends across the centre
- facilitate effective planning and delivery of courses
- identify areas of the curriculum where students excel or struggle
- help pinpoint strengths and weaknesses of students and teaching departments.

Find out more at [ocr.org.uk/activeresults](http://ocr.org.uk/activeresults).

## OCR Professional Development

Attend one of our popular CPD courses to hear directly from a senior assessor or drop in to a Q&A session. All our courses for the academic year 2020-2021 are being delivered live via an online platform, so you can attend from any location.

Please find details for all our courses on the relevant subject page on our [website](#) or visit [OCR professional development](#).

## Need to get in touch?

If you ever have any questions about OCR qualifications or services (including administration, logistics and teaching) please feel free to get in touch with our Customer Support Centre.

General qualifications

**01223 553998**

**general.qualifications@ocr.org.uk**

Vocational qualifications

**02476 851509**

**vocational.qualifications@ocr.org.uk**

For more information visit

 [ocr.org.uk/i-want-to/find-resources/](http://ocr.org.uk/i-want-to/find-resources/)

 [ocr.org.uk](http://ocr.org.uk)

 [/ocrexams](http://ocrexams)

 [/ocrexams](http://ocrexams)

 [/company/ocr](http://company/ocr)

 [/ocrexams](http://ocrexams)

## We really value your feedback

Click to send us an autogenerated email about this resource. Add comments if you want to.

Let us know how we can improve this resource or what else you need. Your email address will not be used or shared for any marketing purposes.



I like this



I dislike this



OCR is part of Cambridge Assessment, a department of the University of Cambridge.

For staff training purposes and as part of our quality assurance programme your call may be recorded or monitored. © OCR 2020 Oxford Cambridge and RSA Examinations is a Company Limited by Guarantee. Registered in England. Registered office The Triangle Building, Shaftesbury Road, Cambridge, CB2 8EA. Registered company number 3484466. OCR is an exempt charity.

OCR operates academic and vocational qualifications regulated by Ofqual, Qualifications Wales and CCEA as listed in their qualifications registers including A Levels, GCSEs, Cambridge Technicals and Cambridge Nationals.

OCR provides resources to help you deliver our qualifications. These resources do not represent any particular teaching method we expect you to use. We update our resources regularly and aim to make sure content is accurate but please check the OCR website so that you have the most up to date version. OCR cannot be held responsible for any errors or omissions in these resources.

Though we make every effort to check our resources, there may be contradictions between published support and the specification, so it is important that you always use information in the latest specification. We indicate any specification changes within the document itself, change the version number and provide a summary of the changes. If you do notice a discrepancy between the specification and a resource, please [contact us](#).

You can copy and distribute this resource freely if you keep the OCR logo and this small print intact and you acknowledge OCR as the originator of the resource.

OCR acknowledges the use of the following content: N/A

Whether you already offer OCR qualifications, are new to OCR or are thinking about switching, you can request more information using our [Expression of Interest form](#).

Please [get in touch](#) if you want to discuss the accessibility of resources we offer to support you in delivering our qualifications.