

Ma

KEY STAGE

3

LEVELS

4–6

Year 7 optional mathematics tests

Teacher's guide

Ma	Year 7 mathematics test	
KEY STAGE 3		
LEVELS 4–6		
	Paper 1 Calculator not allowed	
	First name _____	
	Last name _____	
	Class _____	
	Date _____	
	<p>Please read this page, but do not open your booklet until your teacher tells you to start. Write your name, the name of your class and the date in the spaces above.</p>	
	Remember <ul style="list-style-type: none">■ The test is 1 hour long.■ You must not use a calculator for any question in this test.■ You will need a pen, pencil, rubber and ruler. You may find tracing paper useful.■ Some formulae you might need are on page 2.■ This test starts with easier questions.■ Try to answer all of the questions.■ Write all your answers and working on the test paper – do not use any rough paper. Marks may be awarded for working.■ Check your work carefully.■ Ask your teacher if you are not sure what to do.	
For marking use only	Total marks	

Paper 1

Ma	Year 7 mathematics test	
KEY STAGE 3		
LEVELS 4–6		
	Paper 2	
	First name _____	
	Last name _____	
	Class _____	
	Date _____	
	<p>Please read this page, but do not open your booklet until your teacher tells you to start. Write your name, the name of your class and the date in the spaces above.</p>	
	Remember <ul style="list-style-type: none">■ The test is 1 hour long.■ You will need a pen, pencil, rubber, pair of compasses, ruler and calculator. You may find tracing paper useful.■ Some formulae you might need are on page 2.■ This test starts with easier questions.■ Try to answer all of the questions.■ Write all your answers and working on the test paper – do not use any rough paper. Marks may be awarded for working.■ Check your work carefully.■ Ask your teacher if you are not sure what to do.	
For marking use only	Total marks	

Paper 2

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First published 2007
Updated 2011

© Qualifications and Curriculum Development Agency 2011

ISBN 978-1-84962-436-7

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Printed in Great Britain by the Qualifications and Curriculum Development Agency under the authority and superintendence of the Controller of Her Majesty's Stationery Office and Queen's Printer of Acts of Parliament.

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The 2011 year 7 optional mathematics tests and mark schemes were developed by the National Foundation for Educational Research (NFER) on behalf of QCDA.

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Introduction

The year 7 optional mathematics tests provide schools with a tool to help monitor pupils' progress against national standards in key stage 3 and an instrument for gathering assessment evidence in support of teacher judgements.

The test materials may be used in whole or in part at any point during key stage 3 to provide valuable qualitative information about pupils' strengths and weaknesses. Teachers may choose to use the materials alongside written work, class discussions and group activities in a variety of contexts. When used in this way the materials can yield evidence in support of teacher assessment, including national curriculum level judgements.

The tests follow a similar structure to the previously statutory end of key stage 3 mathematics tests taken by pupils in year 9. They can be administered and marked formally, and the results may be used to determine a national curriculum level. Even when used in this way, there is still useful additional information that can be discerned from pupils' responses. This guide explains the options in more detail.

The mathematics tests are available in two tiers, covering levels 3–6. This Teacher's guide is for the 4–6 tier. A separate guide is available for the 3–4 tier.

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Supporting teacher assessment

The optional key stage 3 mathematics tests aim to be supportive of school assessment arrangements and can be used as part of an integrated approach to teacher assessment. Assessing Pupils' Progress (APP) material may be used alongside these tests. APP is a structured approach to periodic assessment, enabling teachers to:

- use information about pupils' strengths and weaknesses to improve teaching, learning and rates of pupils' progress;
- track pupils' progress over a key stage or longer.

The optional test materials may be used in a variety of contexts in order to give pupils the broadest opportunities to show what they can do. Individual questions and pupil responses can be used to stimulate class discussions and group activities, contributing to a rich evidence-base for teacher assessment. The notes on individual questions make some specific suggestions for teaching and learning (see Section B).

Section A: Formal administration

Administering the tests

The guidance in this section must be followed in order to produce a national curriculum level for each pupil using the level thresholds supplied (page 50).

This information is provided for anyone who is involved in administering the tests, including teachers, other members of the school staff, and other adults who may be assisting in the test administration.

The tests should be carried out under test conditions; they may be held in a school hall, classroom or any other suitable accommodation.

Who are the tests suitable for?

The year 7 optional tests are aimed at pupils working within levels 3 to 6. The tests are supplied in two tiers, one covering levels 3 to 4 and the other covering levels 4 to 6. The lower tier is more appropriate for pupils working at levels 3 and 4, while the higher tier is for those working at levels 4, 5 and 6. The guidance below relates to the 4 to 6 tier only.

Test papers – Paper 1 and Paper 2

There are two papers, each of 60 marks. Paper 1 is a non-calculator test and Paper 2 is a calculator-allowed test. Both tests are one hour long.

Each test consists of 29 questions. Where a question part is worth more than one mark, pupils are able to obtain partial credit for their working even if the final answer is incorrect. Pupils write their working and answers in spaces provided within the answer booklets. Questions are of a variety of types. Some are context-free, but others are placed within everyday, classroom or mathematical contexts. Some questions are routine tests of skill, while others assess application or understanding. Pupils may be required to organise a multi-step calculation for themselves. Some questions ask pupils to explain their reasoning.

Summary of the year 7 optional tests

- Paper 1 at levels 4 to 6, one hour, 60 marks
- Paper 2 at levels 4 to 6, one hour, 60 marks
- Total marks available 120 (60 + 60)

Equipment needed for the tests

In addition to pens, pencils, rubbers and rulers, the following equipment will need to be available to pupils when they take the tests:

Paper 1 Tracing paper (optional)

Paper 2 Calculator, pair of compasses, tracing paper (optional)

Pupils must not have access to a calculator during Paper 1.

Timing

Pupils should be given 60 minutes to complete each test. You may indicate to the pupils when they are halfway through the time allowed for the test, and again a few minutes before they have to stop.

Introducing the tests

Teachers are advised to draw pupils' attention to the 'Remember' section on the front cover of the test booklet, and to the instructions and formulas on page 2.

It is important to brief pupils fully before they begin each paper. Some of the points that you might want to cover are:

- The test is one hour long.
- Check the list of equipment on the front cover of your paper, to make sure you have what you may need.
- If you want to change your answer, put a neat line through the response you don't want. For changes to diagrams use a rubber.
- The test starts with easier questions. Try to answer all the questions in the booklet.
- Write all your answers and working in the test booklet – do not use rough paper. Marks may be awarded for your working even if your answer is wrong.
- Remember to check your work carefully.
- I will tell you when we are halfway through the test and also tell you when we are into the last five minutes. I will tell you when the test is over and you must stop writing.
- If you have any urgent questions during the test you should put up your hand and wait for someone to come to you. You must not talk to each other.

For Paper 2 only:

- You may use a calculator in this test. Make sure you have your calculator and that it is working properly.

Helping pupils during the tests

Teachers should ensure that pupils are clear about what they have to do but should not provide help with the mathematics being tested. Teachers should not help by explaining specific mathematical terms, nor by interpreting graphs or mathematical tables or diagrams. If a pupil asks for clarification of a mathematical symbol or notation then the teacher may read it to the pupil but should not indicate the operation or process to be used.

Access arrangements

These tests have been designed to be accessible to the great majority of pupils working at levels 4–6 in mathematics. Schools are free to make adaptations to the tests that will improve their accessibility for pupils with special educational needs and pupils for whom English is an additional language. In making any changes to the way the tests are administered, the focus should be on the assessment needs of the individual pupil. Any adaptations should be similar to those made to the materials with which pupils work in the classroom.

Examples of appropriate adaptations

School-based adaptations to the tests may include:

- allowance of up to 25 per cent additional time
- use of readers, signers, amanuenses
- provision of tactile shapes and number cards
- separating the tests into sections, taping, photocopying onto coloured paper, use of coloured overlays, use of apparatus
- enhancing the shading on diagrams, including charts and graphs, to increase visual clarity
- enlarging diagrams, cutting them out, embossing or mounting them on card or other material according to normal classroom practice
- translation of words or phrases in the test papers that are likely to prove difficult for pupils for whom English is an additional language, and also if required for pupils who use British sign language (BSL) or other sign-supported communication
- use of bilingual dictionaries.

Access arrangements should not provide an unfair advantage. It is important to ensure that any assistance given does not alter the nature of the test questions, and that any answer given is the pupil's own.

Modified large print, enlarged print and Braille test papers for visually impaired pupils are available from the QCDA modified test agency. Additional guidance notes for teachers administering the modified versions of the tests are supplied with the test papers.

If you have any questions about ordering the modified tests, contact the QCDA modified optional test agency on: 0844 500 6727.

For further guidance on access arrangements please refer to *Access arrangements*, available on the QCDA website at: www.qcda.gov.uk/assessment/3798.aspx

Marking the tests

The structure of the mark scheme

Pages 12–19 of this booklet contain guidelines on how to mark the 4 to 6 tier tests. The guidance in this section must be followed in order to produce a national curriculum level for each pupil using the level thresholds supplied (page 50).

This general guidance should be observed unless specific instructions to the contrary are given, and should be read before marking begins. It could form the basis of departmental INSET to ensure standardisation of marking within, and between, schools.

The marking information for questions within the tests is set out in the form of tables which start on page 20 (Paper 1) and page 36 (Paper 2). The columns to the left of each table provide a quick reference to the question number, question part and the total number of marks available for that question part. There is also an indication of where it may be necessary to refer to the general guidance.

The **Correct response** column usually includes two types of information:

- a statement of the requirements for the award of each mark, with an indication of whether credit can be given for correct working, and whether the marks are independent or cumulative
- examples of some different types of correct response, including the most common.

The **Additional guidance** column indicates alternative acceptable responses, and provides details of specific types of response that are minimally acceptable or unacceptable. Other guidance, such as when ‘follow-through’ is allowed, is provided as necessary.

Questions with a *Using and applying mathematics* element are identified in the mark scheme by an encircled U with a number that indicates the significance of using and applying mathematics in answering the question. The U number can be any whole number from 1 to the number of marks in the question.

For some graphical and diagrammatic responses, including those in which judgements on accuracy are required, marking overlays have been provided (see centre pages of this booklet).

Recording marks on the test paper

All questions, even those not attempted by the pupil, should be marked, with a 1 or a 0 entered in each marking space. Where two marks can be split into one mark gained and one mark lost, with no explicit order, then this should be recorded by the marker as $\frac{1}{0}$

The total marks awarded for a double page can be written in the box at the bottom of the right-hand page, enabling the correct total to be more easily transferred to the front of the test paper.

Finding levels

A total of 120 marks is available (60 from Paper 1 and 60 from Paper 2). The sum of the marks allocated from these two components indicates the level at which the pupil is working.

The level thresholds can be found on page 50.

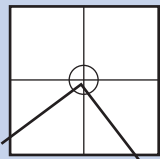
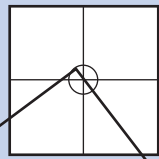
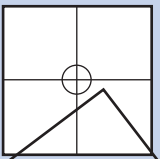
General guidance for marking

Answers that are numerically or algebraically equivalent are acceptable unless the mark scheme states otherwise.

In order to ensure consistency of marking, the most frequent procedural queries are listed on the following two pages with the prescribed correct action. This is followed by further guidance relating specifically to the marking of questions that involve money, negative numbers, algebra, time, coordinates, probability, or tick-box and explanation. Unless otherwise specified in the mark scheme, markers should apply the following guidelines in all cases.

Procedural queries

What if ...	Marking procedure
<i>The pupil's response does not match closely any of the examples given.</i>	Markers should use their judgement in deciding whether the response corresponds with the statement of requirements given in the Correct response column. Refer also to the Additional guidance column.
<i>The pupil has responded in a non-standard way.</i>	Calculations, formulae and written responses do not have to be set out in any particular format. Pupils may provide evidence in any form as long as its meaning can be understood. Diagrams, symbols or words are acceptable for explanations or for indicating a response. Any correct method of setting out working, however idiosyncratic, is acceptable. Provided there is no ambiguity, condone the continental practice of using a comma for a decimal point.
<i>The pupil has made a conceptual error.</i>	In some questions, a method mark is available provided the pupil has made a computational, rather than conceptual, error. A computational error is a 'slip' such as writing $4 \times 6 = 18$ in an otherwise correct long multiplication. A conceptual error is a more serious misunderstanding of the relevant mathematics; when such an error is seen no method marks may be awarded. Examples of conceptual errors are: misunderstanding of place value, such as multiplying by 2 rather than 20 when calculating 35×27 ; subtracting the smaller digit from the larger in calculations such as $45 - 26$ to give the answer 21; incorrect signs when working with negative numbers.
<i>The pupil's accuracy is marginal according to the overlay provided.</i>	Overlays can never be 100% accurate. However, provided the answer is within, or touches, the boundaries given, the mark(s) should be awarded.
<i>The pupil's answer correctly follows through from earlier incorrect work.</i>	Follow-through marks may be awarded only when specifically stated in the mark scheme, but should not be allowed if the difficulty level of the question has been lowered. Either the correct response or an acceptable follow-through response should be marked as correct.
<i>There appears to be a misreading affecting the work.</i>	This is when the pupil misreads the information given in the question and uses different information. If the original intention or difficulty level of the question is not reduced, deduct only one mark. If the original intention is changed or the difficulty level is reduced then do not award any marks for the question part.
<i>The correct answer is in the wrong place.</i>	Where a pupil has shown understanding of the question, the mark(s) should be given. In particular, where a word or number response is expected, a pupil may meet the requirement by annotating a graph or labelling a diagram elsewhere in the question.

What if ...	Marking procedure								
<i>The final answer is wrong but the correct answer is shown in the working.</i>	<p>Where appropriate, detailed guidance will be given in the mark scheme and must be adhered to. If no guidance is given, markers will need to examine each case to decide whether:</p> <table> <tr> <td>the incorrect answer is due to a transcription error</td><td>If so, award the mark.</td></tr> <tr> <td>in a question not testing accuracy, the correct answer has been given but then rounded or truncated</td><td>If so, award the mark.</td></tr> <tr> <td>the pupil has continued to give redundant extra working which does not contradict work already done</td><td>If so, award the mark.</td></tr> <tr> <td>the pupil has continued, in the same part of the question, to give redundant extra working which does contradict work already done.</td><td>If so, do not award the mark. Where a question part carries more than one mark, only the final mark should be withheld.</td></tr> </table>	the incorrect answer is due to a transcription error	If so, award the mark.	in a question not testing accuracy, the correct answer has been given but then rounded or truncated	If so, award the mark.	the pupil has continued to give redundant extra working which does not contradict work already done	If so, award the mark.	the pupil has continued, in the same part of the question, to give redundant extra working which does contradict work already done.	If so, do not award the mark. Where a question part carries more than one mark, only the final mark should be withheld.
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the pupil has continued, in the same part of the question, to give redundant extra working which does contradict work already done.	If so, do not award the mark. Where a question part carries more than one mark, only the final mark should be withheld.								
<i>The pupil's answer is correct but the wrong working is seen.</i>	A correct response should always be marked as correct unless the mark scheme states otherwise.								
<i>The correct response has been crossed or rubbed out and not replaced.</i>	Mark, according to the mark scheme, any legible crossed or rubbed out work that has not been replaced.								
<i>More than one answer is given.</i>	If all the answers given are correct, or if a correct range is given, the mark should be awarded unless prohibited by the mark scheme. If both correct and incorrect responses are given, no mark should be awarded.								
<i>The answer is correct, but in a later part of the question the pupil has contradicted their response.</i>	A mark given for one part should not be disallowed for working or answers given in a different part, unless the mark scheme specifically states otherwise.								
<i>The pupil has drawn lines which do not meet at the correct point.</i>	<p>Markers will interpret the phrase 'slight inaccuracies in drawing' to mean 'within or on a circle of radius 2mm with centre at the correct point'.</p> <div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;">  <p>within the circle accepted</p> </div> <div style="text-align: center;">  <p>on the circle accepted</p> </div> <div style="text-align: center;">  <p>outside the circle not accepted</p> </div> </div>								

Marking specific types of question

Responses involving money For example: £3.20 £7	
Accept ✓	Do not accept ✕
✓ Any unambiguous indication of the correct amount eg £3.20(p), £3 20, £3,20, 3 pounds 20, £3-20, £3 20 pence, £3:20, £7.00	✕ Incorrect or ambiguous indication of the amount eg £320, £320p or £700p
✓ The unit, £ or p, is usually printed in the answer space. Where the pupil writes an answer outside the answer space with no units, accept responses that are unambiguous when considered alongside the given units eg with £ given in the answer space, accept 3.20 7 or 7.00	✕ Ambiguous use of units outside the answer space eg with £ given in the answer space, do not accept 3.20p outside the answer space
✓ Given units amended eg with £ crossed out in the answer space, accept 320p 700p	✕ Incorrect placement of decimal points, spaces, etc or incorrect use or omission of 0 eg £3.2, £3 200, £32 0, £3-2-0 £7.0

Responses involving negative numbers For example: -2	
Accept ✓	Do not accept ✕
	<p>To avoid penalising the error below more than once within each question, do not award the mark for the <i>first</i> occurrence of the error within each question. Where a question part carries more than one mark, only the final mark should be withheld.</p> <p>✕ Incorrect notation eg 2-</p>

Responses involving the use of algebra For example: $2 + n$ $n + 2$ $2n$ $\frac{n}{2}$ n^2	
Accept ✓	Take care ! Do not accept ✕
✓ Unambiguous use of a different case or variable eg N used for n x used for n	! Unconventional notation eg $n \times 2$ or $2 \times n$ or $n2$ or $n + n$ for $2n$ $n \times n$ for n^2 $n \div 2$ for $\frac{n}{2}$ or $\frac{1}{2}n$ $2 + 1n$ for $2 + n$ $2 + 0n$ for 2 Within a question that demands simplification, do not accept as part of a final answer involving algebra. Accept within a method when awarding partial credit, or within an explanation or general working.
	✕ Embedded values given when solving equations eg in solving $3x + 2 = 32$, $3 \times 10 + 2 = 32$ for $x = 10$ To avoid penalising the two types of error below more than once within each question, do not award the mark for the <i>first</i> occurrence of each type within each question. Where a question part carries more than one mark, only the final mark should be withheld.
✓ Words used to precede or follow equations or expressions eg $t = n + 2$ tiles or tiles = $t = n + 2$ for $t = n + 2$! Words or units used within equations or expressions eg n tiles + 2 n cm + 2 Do not accept on their own. Ignore if accompanying an acceptable response.
✓ Unambiguous letters used to indicate expressions eg $t = n + 2$ for $n + 2$	✕ Ambiguous letters used to indicate expressions eg $n = n + 2$ for $n + 2$

Responses involving time <i>A time interval For example: 2 hours 30 minutes</i>	
Accept ✓	Take care ! Do not accept ✕
✓ Any unambiguous indication eg 2.5 (hours), 2h 30 ✓ Digital electronic time ie 2:30	✕ Incorrect or ambiguous time interval eg 2.3(h), 2.30, 2-30, 2h 3, 2.30 min ! The unit, hours and/or minutes, is usually printed in the answer space. Where the pupil writes an answer outside the answer space, or crosses out the given unit, accept answers with correct units, unless the question has specifically asked for other units to be used.
A specific time For example: 8:40am 17:20	
Accept ✓	Do not accept ✕
✓ Any unambiguous, correct indication eg 08.40, 8.40, 8:40, 0840, 8 40, 8-40, twenty to nine, 8,40 ✓ Unambiguous change to 12 or 24 hour clock eg 17:20 as 5:20pm, 17:20pm	✕ Incorrect time eg 8.4am, 8.40pm ✕ Incorrect placement of separators, spaces, etc or incorrect use or omission of 0 eg 840, 8:4:0, 084, 84

Responses involving coordinates <i>For example: (5, 7)</i>	
Accept ✓	Do not accept ✕
✓ Unconventional notation eg (05, 07) (five, seven) $\begin{smallmatrix} x & y \\ (5, 7) \end{smallmatrix}$ ($x = 5$, $y = 7$)	✕ Incorrect or ambiguous notation eg (7, 5) $\begin{smallmatrix} y & x \\ (7, 5) \end{smallmatrix}$ (5x, 7y) (5 ^x , 7 ^y) ($x - 5$, $y - 7$)

Responses involving probability <i>A numerical probability should be expressed as a decimal, fraction or percentage only</i> For example: 0.7 $\frac{7}{10}$ 70%	
Accept ✓	Take care ! Do not accept ✕
✓ Equivalent decimals, fractions and percentages eg 0.700, $\frac{70}{100}$, $\frac{35}{50}$, 70.0%	<p>The first four categories of error below should be ignored if accompanied by an acceptable response, but should not be accepted on their own.</p> <p>However, to avoid penalising the first three types of error below more than once within each question, do not award the mark for the <i>first</i> occurrence of each type of error unaccompanied by an acceptable response. Where a question part carries more than one mark, only the final mark should be withheld</p> <p>! A probability that is incorrectly expressed eg 7 in 10 7 over 10 7 out of 10 7 from 10</p> <p>! A probability expressed as a percentage without a percentage sign</p> <p>! A fraction with other than integers in the numerator and/or denominator</p> <p>! A probability expressed as a ratio eg 7 : 10, 7 : 3, 7 to 10</p> <p>✕ A probability greater than 1 or less than 0</p>
✓ A probability correctly expressed in one acceptable form which is then incorrectly converted, but is still less than 1 and greater than 0 eg $\frac{70}{100} = \frac{18}{25}$	


Responses involving tick-box and explanation For example: <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Cannot tell Explain your answer	
Accept ✓	Do not accept ✕
✓ Where an incorrect box is ticked and the explanation is correct: Where the tick-box options are Yes/No only, accept a correct explanation that is better than minimally acceptable.	✕ A minimally acceptable response with the incorrect box ticked. ✕ A correct explanation with 'Cannot tell' ticked incorrectly (unless the pupil's intention to tick the correct box is clear from the explanation).

Mark scheme for Paper 1

Question	Area shading		
1		Correct response	Additional guidance
a	1m	8	
b	1m	32	✓ Follow-through as 4 × their (a)

[illegible]

Question	Chains		
3		Correct response	Additional guidance
a	1m	Gives both correct values in the correct positions, ie 11 26	
b	1m	Gives two correct values eg <ul style="list-style-type: none"> ▪ 3 and 1 ▪ 4 and 3 ▪ 5 and 5 ▪ 6 and 7 ▪ 10 and 15 ▪ 2 and -1 ▪ 2.5 and 0 	✗ Incorrect statement eg <ul style="list-style-type: none"> ♦ Multiply by 5, then subtract -5
	1m	Gives the correct value which follows their rule eg <ul style="list-style-type: none"> ▪ their <i>correct</i> rule: Multiply by 3, then subtract 1 2 → 5 → 14 ▪ their <i>correct</i> rule: Multiply by 4, then subtract 3 2 → 5 → 17 	✓ Follow-through from their incorrect rule eg <ul style="list-style-type: none"> ♦ their <i>incorrect</i> rule: Multiply by 4, then subtract 1 correct follow-through 2 → 5 → 19 ♦ their <i>incorrect</i> rule: Multiply by 10, then subtract 7 correct follow-through 2 → 5 → 43

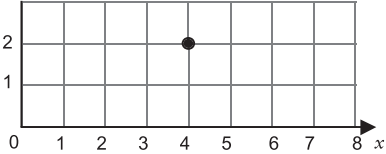
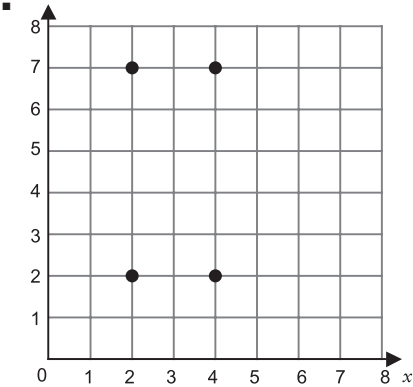
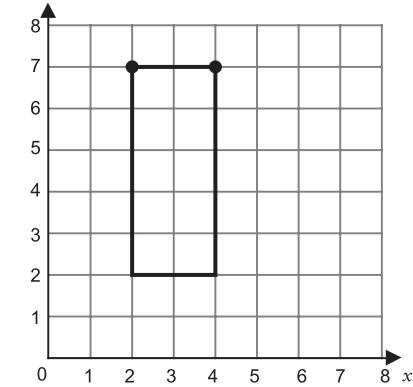
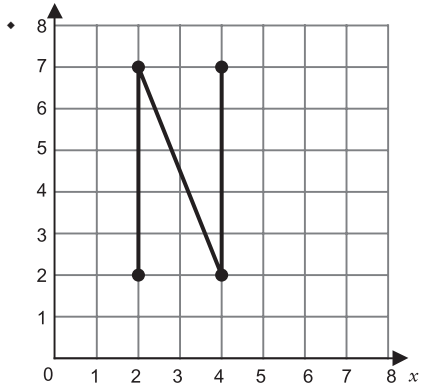
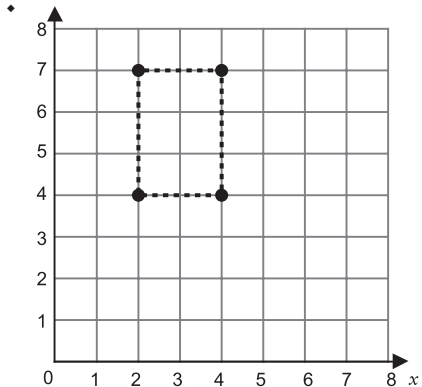
Question	 See General guidance for marking – Tick-box and explanation		Groups
4		Correct response	Additional guidance
a	1m	13 and 5	
b	1m	Indicates No and gives a correct explanation eg <ul style="list-style-type: none"> 13 is higher than 6 13 brought 4 to 6 Most brought 4–6 Because 4 to 6 has more cans Because only $\frac{1}{4}$ brought 1-3 but $\frac{3}{4}$ brought a different amount 	✓ <i>Minimally acceptable response</i> eg <ul style="list-style-type: none"> No, because on the grid it says 4 to 6
c	1m	Indicates Yes and gives a correct explanation eg <ul style="list-style-type: none"> 18 is lower than 20 the group with 4 brought 2 more cans than the group with 9 	✓ <i>Minimally acceptable response</i> eg <ul style="list-style-type: none"> Yes, 18/20 Yes, 2 less ✗ <i>Incorrect explanation</i> eg <ul style="list-style-type: none"> Yes, 5 is more than 2 ✗ <i>Incomplete explanation</i> eg <ul style="list-style-type: none"> Yes, there are 5 pupils who brought 4 cans and there are 2 pupils who brought 9 cans. Yes, the group who brought 4 cans were more than the group who brought 9 cans.


U2

Question			Numbers
5		Correct response	Additional guidance
	2m	Gives all three correct values, ie 100 000 1 0.1	✓ <i>Fractions</i> eg <ul style="list-style-type: none"> last line $\frac{1}{10}$
	or 1m	Gives two correct values	✗ <i>Operations</i> eg <ul style="list-style-type: none"> $42 \times 1 \div 10 = 4.2$

Question	Hidden		
7		Correct response	Additional guidance
	1m	<p>Indicates the correct shape, ie</p> <div> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> </div>	

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Question		See General guidance for marking – Coordinates	Draw shape
9		Correct response	Additional guidance
a	1m	(4, 7)	
b	1m	<p>Indicates the point (4, 2), ie</p> 	<p>✓ Ignore incorrect labelling or no labelling of the point</p>
c	1m	<p>Indicates the points (4, 2) and (2, 2) eg</p>  	<p>✓ Correct point plotted but shape not drawn</p> <p>✗ Shape drawn that is not a quadrilateral eg</p>  <p>✓ Follow-through from their incorrect point in part (b). Accept provided the four points form vertices of a rectangle which is not a square eg</p> 

Question		 See General guidance for marking – Tick-box and explanation	Olympics
10		Correct response	Additional guidance
a	1m	97	
b	1m	Indicates the correct number of rounds, ie in none of them in 1 of them in 2 of them <div style="border: 1px solid black; border-radius: 50%; padding: 2px; display: inline-block;">in 3 of them</div> in all of them	
c	1m	Indicates No and explains that London got too few votes (39) in the third round to make up the number of votes (54) it got in the fourth round eg <ul style="list-style-type: none"> ■ 54 is more than 39 ■ Only 39 voted in third round ■ If Alex was correct London would have had 54 (or more) votes in the third round ■ 15 more people voted for London ■ $54 - 39 = 14$ (error) The other 14 voted another country ■ There were not as many votes in the third round as the fourth round ■ In all of the rounds London kept getting more votes 	<p>✓ <i>Minimally acceptable explanation</i> eg</p> <ul style="list-style-type: none"> ◆ No, 3rd 39 people, 4th 54 people <p>✗ <i>Incomplete explanation</i> eg</p> <ul style="list-style-type: none"> ◆ No, third round 39 people ◆ No, there was a different number than 54 ◆ No, because there would be more votes <p>✗ <i>Incorrect or irrelevant explanation</i> eg</p> <ul style="list-style-type: none"> ◆ Only 103 people voted in the third vote, and 104 people voted in the fourth vote ◆ All rounds had different number of votes. If they are allowed to vote again, it will all be the same amount each time <p>✓ <i>Additional information, whether correct or incorrect, so long as it does not contradict the correct explanation</i> eg</p> <ul style="list-style-type: none"> ◆ Because in both rounds there were 104 people voting but in the 3rd round London only got 39 votes but in the 4th they got 54. 31 people changed their minds. 17 voted Paris and 15 voted London <p>✗ <i>Several explanations given including incorrect ones</i> eg</p> <ul style="list-style-type: none"> ◆ 39 is less than 54 and if you add 39, 33, 31 together it equals more, not the same – so Alex is wrong ◆ In the third round only 39 people voted for London and one person less voted in round 3 to round 4

U1

Signs










Question				Signs
11		Correct response	Additional guidance	
	1m	<p>Gives two correct sets of signs from the list below</p> <p>+++ × − × × − ÷ + × × + × ÷</p>	<p>✓ <i>Brackets in a correct solution</i> eg • $4 \times (3 \div 2 + 1) = 10$</p> <p>✓ <i>Unambiguous indication of the correct signs shown in calculation elsewhere on the page</i> eg • $4 \times 3 = 12$ $2 \div 1 = 2$ $12 - 2 = 10$</p>	

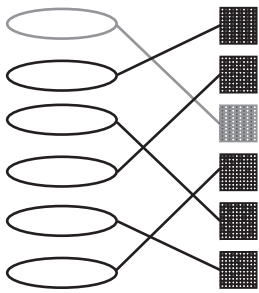
Forest

Question				Forest
12		Correct response	Additional guidance	
a	1m	Canada	<p>✗ <i>Value given instead of the name of the country</i> eg • (part a) 2446</p>	
b	1m	Finland		
c	1m	50		

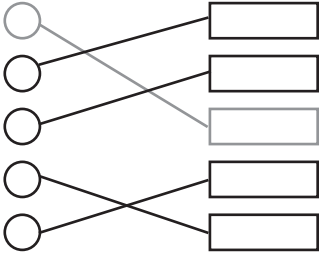
Question	Marking overlay available	Rotate triangle
13	Correct response	Additional guidance
2m or 1m	<p>Draws the triangle correctly rotated with vertices within the tolerances as shown on the overlay</p> <p>Draws a triangle with two vertices positioned correctly, within the tolerances as shown on the overlay</p> <p>eg</p> <div data-bbox="325 568 852 824"> </div> <p>or</p> <p>Draws a correct triangle correctly orientated but in an incorrect position. (Markers can slide the overlay horizontally and/or vertically, but must not turn it over or rotate it)</p> <p>eg</p> <div data-bbox="325 1055 887 1357"> </div> <p>or</p> <p>Rotates the triangle 90° clockwise around the point R ie</p> <div data-bbox="373 1563 651 1792"> </div>	<p>✓ <i>Lines not ruled or accurate</i> Accept provided the pupil's intention is clear</p> <p>✗ <i>Additional triangles</i> eg</p> <div data-bbox="1015 517 1270 819"> </div>

Question		Cards	
14		Correct response	Additional guidance
a	1m	<p>Gives one pair of fractions from the list below, in either order</p> $\frac{1}{2} = \frac{3}{6}$ $\frac{1}{3} = \frac{2}{6}$ $\frac{2}{1} = \frac{6}{3}$ $\frac{3}{1} = \frac{6}{2}$	<p>✖ <i>Numbers used are not numbers given</i></p> <p>✖ <i>Numbers repeated within a question part</i></p>
b	1m	Gives a different correct pair of fractions to those given in part (a)	<p>✖ <i>For part (b), the same pair of fractions given as in part (a) but in reverse order</i> eg</p> <p>♦ part (a) $\frac{3}{6} = \frac{1}{2}$, (mark 1)</p> <p>part (b) $\frac{1}{2} = \frac{3}{6}$, (mark 0)</p>

Question		Rectangle	
15		Correct response	Additional guidance
a	1m	<p>Draws two straight lines that divide the rectangle into two triangles and one quadrilateral</p> <p>eg</p> <ul style="list-style-type: none">       	<p>✓ Accept inaccuracies in drawing provided the pupil's intention is clear</p>
	U1		
b	1m	<p>Draws two straight lines that divide the rectangle into three triangles</p> <p>eg</p> <ul style="list-style-type: none">    	
	U1		

Question		Hundred square	
16		Correct response	Additional guidance
	2m	Matches all five descriptions correctly, ie 	✗ <i>Description matched to more than one hundred square</i> For 2m or 1m, do not accept as a correct match
	or 1m	Matches at least three descriptions correctly	

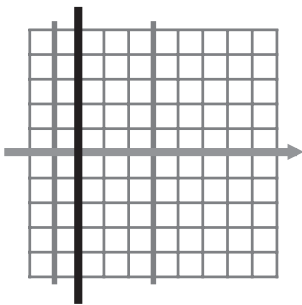
Question		a and b	
17		Correct response	Additional guidance
a	2m	Gives four pairs of values with a product of 24 eg <ul style="list-style-type: none"> ▪ 1 and 24 2 and 12 3 and 8 4 and 6 	✓ <i>Values for a and b swapped</i> eg <ul style="list-style-type: none"> ♦ -1 and -24 -24 and -1 1 and 24 24 and 1
	or 1m	Gives three correct pairs of values	✓ <i>Decimals and fractions</i> eg <ul style="list-style-type: none"> ♦ $\frac{1}{2}$, and 48 ♦ 1.5 and 16
b	1m	Gives 4 and 6 in either order	

Question	Charts		
18		Correct response	Additional guidance
	2m	Matches all four pie charts correctly, ie 	<p>✗ <i>Pie chart matched to more than one bar chart</i> For 2m or 1m, do not accept as a correct match</p>
	or 1m	Matches at least two pie charts correctly	

Question		Shop									
19		Correct response	Additional guidance								
a	1m	11am	✓ 11								
b	1m	5	<p>! Follow-through Accept follow-through as</p> <table><tr><th>their answer in part (a)</th><th>accept in part (b)</th></tr><tr><td>10(am)</td><td>7</td></tr><tr><td>12(pm)</td><td>6</td></tr><tr><td>1(pm)</td><td>12</td></tr></table>	their answer in part (a)	accept in part (b)	10(am)	7	12(pm)	6	1(pm)	12
their answer in part (a)	accept in part (b)										
10(am)	7										
12(pm)	6										
1(pm)	12										
	U1										

Question	Similar		
20		Correct response	Additional guidance
	1m	Gives three edge lengths other than those shown, in the ratio 5:9:10, in any order eg <ul style="list-style-type: none"> 10, 18, 20 100, 90, 50 	<p>✓ <i>Accept the use of a fractional scale factor</i> eg <ul style="list-style-type: none"> $2\frac{1}{2}$, $4\frac{1}{2}$, 5 </p>
	1m	Gives 63, 87, 30 in any order	

Question	See General guidance for marking – Probability		Marbles				
22		Correct response	Additional guidance				
a	1m	<p>Gives both correct entries, ie</p> <table border="1"><tr><td>black</td><td>red</td></tr><tr><td>$\frac{4}{7}$</td><td>$\frac{2}{7}$</td></tr></table>	black	red	$\frac{4}{7}$	$\frac{2}{7}$	<p>✓ <i>Equivalent fractions</i></p> <p>eg</p> <ul style="list-style-type: none">part (a) $\frac{8}{14}$ black$\frac{6}{21}$ redpart (b) $\frac{15}{30}$ black$\frac{8}{30}$ red
black	red						
$\frac{4}{7}$	$\frac{2}{7}$						
b	<p>2m</p> <p><i>or</i></p> <p>1m</p>	<p>Gives both correct values, ie</p> <p>$\frac{1}{2}$ black</p> <p>$\frac{4}{15}$ red</p> <p>Gives one correct value</p> <p>or</p> <p>Gives two incorrect values with sum $\frac{23}{30}$ or equivalent</p> <p>eg</p> <ul style="list-style-type: none">$\frac{5}{30}$ black$\frac{18}{30}$ red					

Question	Axes		
23		Correct response	Additional guidance
	1m	<p>Draws the y-axis in the correct position, ie</p> 	<p>✓ <i>Axis without arrow head or with incomplete arrow head(s)</i></p> <p>✓ <i>Axis without a label or with an incorrect label</i></p> <p>! <i>Short or unruled line</i> Accept provided the pupil's intention is clear</p>
	U1		

Question	Counters		
24		Correct response	Additional guidance
	1m	$\frac{1}{3}$ or 0.3(333...)	<p>✓ <i>Equivalent fractions</i></p> <p>✗ <i>A ratio</i> eg ♦ 1:2</p>

Question	Sequence		
25		Correct response	Additional guidance
	2m	Gives all five correct values, ie	✓ <i>Decimals</i> eg ♦ 96, 48, 24, ... 1.5, 0.75
	or		
	1m	Gives four correct values	✓ <i>Ignore further terms given, whether correct or incorrect</i>
		or	
		Makes one error and follows it through consistently eg	
		<ul style="list-style-type: none"> 104, 52, 26 (<i>error</i>), ... $1\frac{1}{2}$, $\frac{3}{4}$ 96, 48, 24, ... $2\frac{1}{2}$ (<i>error</i>), $1\frac{1}{4}$ 	

Question	Magic structured		
26		Correct response	Additional guidance
1m			<p>✓ <i>Unambiguous indication of the correct equation</i> eg</p> <ul style="list-style-type: none"> • -w in second to last box and last box blank <p>✗ <i>Duplicating division</i> ie ÷2 (in the bottom box)</p> <p>✗ <i>A number, or a letter other than w, used for the unknown</i></p>

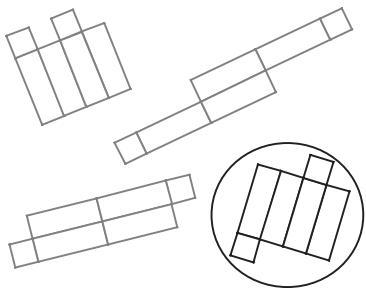
Question	Angle chase		
27		Correct response	Additional guidance
1m		50	<p>✓ <i>Ignore units</i> eg</p> <ul style="list-style-type: none"> • 50°

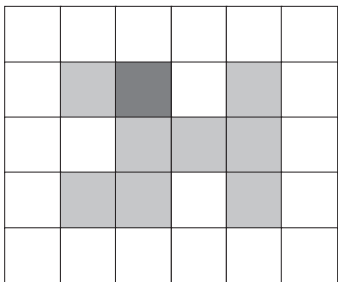
Question	Mean		
28		Correct response	Additional guidance
1m		<p>Indicates 8, ie</p> <p>12 8 11 7 2</p>	

Question	Fractions		
29		Correct response	Additional guidance
a	1m	75	
b	1m	0.375	<p>✓ <i>Follow-through as their (a) × 0.005</i> eg</p> <ul style="list-style-type: none"> • part (a) 88, (mark 0) • part (b) 0.44, (mark 1) <p>✗ <i>Rounding</i> eg</p> <ul style="list-style-type: none"> • 0.38


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Mark scheme for Paper 2

Question		Cuboid net	
1		Correct response	Additional guidance
	1m	<p>Indicates the correct shape, ie</p> 	

Question		Lines	
2		Correct response	Additional guidance
	1m	<p>Indicates the correct square, ie</p> 	

Question		Robot	
3		Correct response	Additional guidance
a	1m	Gives both correct entries, ie $\times 4$ $\times 2$	\times Multiplication signs omitted
b	1m	24	\times 24 r 1

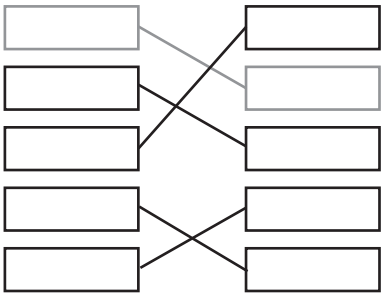
Question	 See General guidance for marking – Tick-box and explanation Rollercoaster		
4		Correct response	Additional guidance
a	1m	Indicates both correct rollercoasters, ie <div> <div>Big One</div> <div>Oblivion</div> <div>Jubilee</div> <div>Rita</div> <div>Millennium</div> </div>	
b	1m	Indicates No and identifies the Big One as being 1675 or as being longer than 1455 eg <ul style="list-style-type: none"> Second longest is 1675 Must be more than 1675 Big One is longer than 1455 The Big One is even bigger Second longest is longer 	✓ <i>Reference to 1675 as being the longest</i> Condone provided false statements are not made eg accept <ul style="list-style-type: none"> No, the longest rollercoaster is 1675 No, it is 1675 No, 1675 ✗ <i>False statements</i> eg <ul style="list-style-type: none"> The UK's longest rollercoaster is 1675 The biggest rollercoaster in the world is the Big One and on the table it shows that it is 1675m in length Second <i>highest</i> is 1675 ✗ <i>Explanation based on 1455 not being in the table</i> eg <ul style="list-style-type: none"> 1455 is not the longest because in the chart it says 1675, 373, 891, 640, 834

Question	Guess		
5		Correct response	Additional guidance
	1m	Gives a value between 1.5 and 1.6 exclusive	✗ <i>Incorrect notation</i> eg <ul style="list-style-type: none"> $1.5\frac{1}{2}$

Question	Grid		
6		Correct response	Additional guidance
a	1m ⓪1	1121	
b	1m ⓪1	3406	
c	1m ⓪1	9739	

Question	Restaurant		
7		Correct response	Additional guidance
a	1m	(\pm) 90 or (\pm) 270	✓ <i>Values that are the result of $90 + 360n$ or $270 + 360n$</i> eg • 450 • 630 • 810 • 990 • -450
b	1m	Gives a correct value that is different to their response in part (a)	

Question	Rounding		
8		Correct response	Additional guidance
	2m or 1m	Indicates all four correct values, ie 14.45 ⓪14.54 ⓪14.55 ⓪15.44 ⓪15.45 15.54 Indicates three correct values and no incorrect values or Indicates all four correct values and one incorrect value	

Question	Same		
9		Correct response	Additional guidance
	2m	Matches all four values correctly, ie 	<p>✗ <i>Value on the left-hand side matched to more than one value on the right-hand side</i></p> <p>For 2m or 1m, do not accept as a correct match</p>
	or 1m	Matches at least two values correctly	


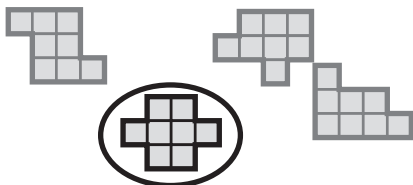
Question	Between		
10		Correct response	Additional guidance
	2m	<p>Gives three correct values</p> <p>In the first line, gives a value between 7 and 8.5 exclusive eg</p> <ul style="list-style-type: none"> ▪ 8 ▪ 7.1 <p>In the second line, gives a value between 7 and 7.5 exclusive eg</p> <ul style="list-style-type: none"> ▪ $7\frac{1}{3}$ ▪ 7.1 <p>In the third line, gives a value between 7 and 7.05 exclusive eg</p> <ul style="list-style-type: none"> ▪ 7.01 ▪ 7.049 	
	or 1m	Gives two correct values	


Question	Number line		
11		Correct response	Additional guidance
	2m	<p>Gives all correct values in the correct positions, ie</p> <div><div>$\frac{1}{3}$</div><div>0.6</div><div>$\frac{9}{10}$</div><div>...</div><div>$1\frac{1}{2}$</div><div>1.75</div></div>	<p>✗ <i>A value written in more than one answer box does not count as a correct response for either box</i></p> <p>✓ <i>Equivalent values</i> eg</p> <ul style="list-style-type: none">• 0.9 in the third box
	or 1m	<p>Gives at least two correct values</p>	

Question	UK films		
12		Correct response	Additional guidance
a	1m	1957	
b	1m	42	<i>* Incomplete response</i> eg ♦ 150 – 108
c	1m	Labels the number of films correctly ie <div data-bbox="327 739 478 799">1200</div> <div data-bbox="327 815 478 875">1000</div> <div data-bbox="327 891 478 952">800</div> <div data-bbox="327 967 478 1028">600</div> <div data-bbox="327 1043 478 1104">400</div> <div data-bbox="327 1120 478 1180">200</div> <div data-bbox="327 1196 478 1256">0</div>	
	1m	Labels the years correctly eg ▪ <div data-bbox="373 1397 525 1458">1950–1959</div> <div data-bbox="563 1397 715 1458">1990–1999</div>	

Number shapes			
13		Correct response	Additional guidance
a	1m	177	
b	1m	Gives both totals correct: 45 18	
	U1		

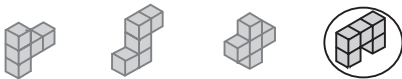
Apricots			
Question		Correct response	Additional guidance
14			
	1m	675	


T & Z			
Question		Correct response	Additional guidance
15			
a	1m	Draws the lines in the correct positions, ie 	
b	1m	Indicates the correct shape, ie 	



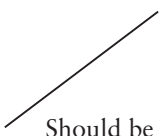
Question	 See General guidance for marking – Money		Garden
16		Correct response	Additional guidance
	3m	£ 19.50	
	or		
	2m	Shows the digits 195	
		or	
		Shows the digits 115 (ie charge for hedge)	
		eg	
		▪ 11.50	
		or	
		Shows evidence of working out the charge for grass as being £8.00	✗ 8 shown with no indication that this is the cost for cutting the grass eg do not accept ♦ $8 \times £0.50 = £4.00$
		eg	
		▪ £8	
		▪ $5 \times 8 = 40$	
		▪ $40 \times 20 = 800$	
	or		
	1m	Finds the length of the hedge as 23	! Condone Incorrect units or no units given
		or	
		Finds the area of the grass as 40	
	(U1)		

Question		Bar and pie													
17		Correct response	Additional guidance												
	2m	Completes all five rows correctly, ie <table><tr><th>Bar chart</th><th>Pie chart</th></tr><tr><td>✓</td><td></td></tr><tr><td>✓</td><td></td></tr><tr><td></td><td>✓</td></tr><tr><td>✓</td><td></td></tr><tr><td></td><td>✓</td></tr></table>	Bar chart	Pie chart	✓		✓			✓	✓			✓	
	Bar chart	Pie chart													
	✓														
✓															
	✓														
✓															
	✓														
	or 1m	Completes four rows correctly													
	U2														

Question	Strawberries		
18		Correct response	Additional guidance
	2m or 1m	700g or 0.7(0...)kg Shows digit 7 with incorrect or no units eg <ul style="list-style-type: none"> ▪ 700 ▪ 70 ▪ 0.07g 	✓ <i>Other correct notation of correct units</i> eg <ul style="list-style-type: none"> • 700 grams • 0.7 kilograms

Question	Isometric		
19		Correct response	Additional guidance
a	1m	Gives 4 and 7 in either order	
b	1m	Indicates the correct shape, ie 	

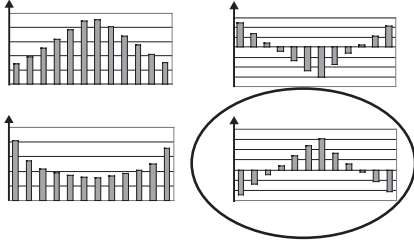
Question	 See General guidance for marking – Money			Trip
20		Correct response	Additional guidance	
a	1m	56	* A decimal or fraction	
b	1m	765		
c	1m	29	* A decimal or fraction	

Question	 See General guidance for marking – Tick-box and explanation		Race
21		Correct response	Additional guidance
a	1m	Dennis	
b	1m	Chris	
c	1m	<p>Indicates No and gives a correct explanation</p> <p>The most common correct explanations:</p> <p>Describe a change in Ali's speed that corresponds to a specific point on the graph</p> <p>eg</p> <ul style="list-style-type: none"> At start Ali started slowly and then got fast Ali was slower at the beginning of the race Ali ran a little bit faster then a little bit slower Over here Ali started to slow down (<i>draws in the correct place on the graph</i>) It was (only) the same at the end <p>Describe Ali's speed throughout the race in a way that corresponds to the graph</p> <p>eg</p> <ul style="list-style-type: none"> Because the graph shows that Ali went slow, fast, slow, speeds up steadily <p>Describe a change on the graph</p> <p>eg</p> <ul style="list-style-type: none"> Because the line is not straight It curves/ goes wobbly/ wonky/ wavy It would be diagonal Its slope changes <div style="text-align: center;">   <p>Should be like this</p> </div>	<p>✖ <i>General description that does not refer to any identifiable point on the graph</i></p> <p>eg</p> <ul style="list-style-type: none"> Ali got slower Ali went slow and fast at one point of the graph Ali kept speeding up and slowing down Because Ali's speed changed Because on the graph Ali's line changes <p>✖ <i>Explanation that does not relate to the graph</i></p> <p>eg</p> <ul style="list-style-type: none"> In a race you go at different speeds <p>✖ <i>Incomplete or ambiguous explanation</i></p> <p>eg</p> <ul style="list-style-type: none"> No, it would be a straight curve No, in the first part the line changes heights <p>✖ <i>False statement</i></p> <p>eg</p> <ul style="list-style-type: none"> The line goes up steeply then it goes down Ali slows down near the end As the line for Ali shows that the speed kept changing for example once Chris overtook Ali People would not have overtaken if Ali ran at constant speed

U1

Question		Quadrilaterals	
23		Correct response	Additional guidance
a	1m	<p>Gives a property that is true for every rectangle and every kite</p> <p>eg</p> <ul style="list-style-type: none"> Two pairs of equal sides 2 of the sides are the same and the other 2 are the same Straight lines/ sides/ edges 4 vertices/ corners/ angles All the degrees add up to 360 Symmetrical Have lines of symmetry/ a line of symmetry/ at least one line of symmetry 2D 	<p>✗ <i>Property that is not true for squares</i></p> <p>eg</p> <ul style="list-style-type: none"> Two sides are longer than the other two sides <p>✗ <i>Incorrect property</i></p> <p>eg</p> <ul style="list-style-type: none"> One line of symmetry (implies exactly one) A pair of parallel lines Opposite sides are the same length Four points <p>✗ <i>Incomplete description</i></p> <p>eg</p> <ul style="list-style-type: none"> 2 of the sides are the same length <p>✗ <i>Repetition of the property given in the question stem</i></p> <p>eg</p> <ul style="list-style-type: none"> They are both quadrilaterals Four sides <p>✗ <i>Responses relating to 3D shapes, indicated through explanations or diagrams</i></p>
b	1m	<p>Gives a property that is true for every rectangle and that is not true for any non-rhombic and non-square kite</p> <p>eg</p> <ul style="list-style-type: none"> All angles are the same All angles 90 degrees It has at least 3 right angles Opposite sides are the same length 2 pairs of parallel lines Parallel sides 	<p>✓ <i>Property that is true only for rectangles which are not squares</i></p> <p>Condone</p> <p>eg</p> <ul style="list-style-type: none"> Two lines of symmetry The shortest sides are opposite <p>✗ <i>Incorrect property</i></p> <p>eg</p> <ul style="list-style-type: none"> Straight lines, no diagonals It has right angles Two sides are parallel

Question		Calculator	
24		Correct response	Additional guidance
	1m	238	<p>✗ <i>A non-whole number</i></p> <p>eg</p> <ul style="list-style-type: none"> 237.999...
	U1		

Question		Daylight	
25		Correct response	Additional guidance
a	1m	Gives all six correct months in any order ie Jan, Feb, Mar, Oct, Nov, Dec	✓ <i>Unambiguous indication of the correct months</i> eg • Jan–Mar, Oct–Dec
b	1m	Indicates the correct chart, ie 	

Question		Marking overlay available	Pentagon
26		Correct response	Additional guidance
	2m or 1m (U2)	<p>Constructs a completed pentagon, sides ruled, with the fifth vertex within the region as shown on the overlay, with construction arcs shown</p> <p>Draws a completed pentagon, sides ruled, with the fifth vertex within the region as shown on the overlay, but no construction arc(s) shown</p> <p>or</p> <p>Draws a completed pentagon, sides ruled, construction arc(s) shown, with the two new sides drawn of an equal but incorrect length</p>	<p>! <i>Use of overlay</i> Markers should use their judgement to determine whether the construction arcs are genuine, but may use the dashed lines on the overlay as a guide</p> <p>! <i>Condone</i></p> <ul style="list-style-type: none"> • A single correct construction arc • Equivalent indication of an arc (eg dots)

Question	Marking overlay available		Conversion graph
27		Correct response	Additional guidance
a	1m	Draws a line completely within the tolerance as shown on the overlay	<p>✗ <i>Points identified inside the tolerance but line not drawn</i></p> <p>! The line must begin at (0, 0) and extend beyond (30, 10)</p>
b	1m	$p = \frac{d}{3}$ or $p = \frac{1}{3}d$	<p>✓ <i>Alternative notation</i></p> <p>eg</p> <ul style="list-style-type: none"> • $p = d \div 3$ • $p = d \times \frac{1}{3}$

Question			Sign
28		Correct response	Additional guidance
	2m or 1m	25.7 or 25.71 or 26 Otherwise correct response but the decimal point is missing or is placed incorrectly eg ▪ 257 or Shows the digits 157 (ie has attempted to calculate the circumference of the circle)	

Question			Hits
29		Correct response	Additional guidance
a	2m	Indicates all three correct years, ie 2000 2001 2002 (2003)	
b		(2000) 2001 2002 2003	
c		2000 2001 2002 (2003)	
	or 1m	Indicates two correct years	

Section B: Using the outcomes of the tests

The following sections provide information about interpreting the outcomes of the year 7 optional mathematics tests in tiers 4 to 6. They explain how teachers can use the test scores to find out more about pupils' attainment in the national curriculum. They also present a number of key findings and useful information obtained during the development of the tests that may be used in support of teacher judgements.

Level thresholds

In order to make use of the information in this section, you should administer the tests according to the guidance in Section A: Formal administration. It is particularly important that you observe the time limits given, follow the test instructions, and mark the questions according to the mark scheme. If you have used the tests in a different context to provide qualitative information about pupils' strengths and weaknesses then the information derived from this section will not be applicable and you should refer to the Key findings and useful information section on page 52.

In a formal administration pupils need to take both test booklets in order for the total marks to be translated into a valid national curriculum level for mathematics overall.

The following tables give an indication of the national curriculum levels for pupils attaining each of the mark ranges in the tests.

Level	Mark range
Below 4	0 – 20
4	21 – 45
4C	21 – 28
4B	29 – 36
4A	37 – 45
5	46 – 72
5C	46 – 54
5B	55 – 63
5A	64 – 72
6	73 – 120
6C	73 – 89
6B	90 – 105
6A	106 – 120

Variability of results

Any scores derived from a test are subject to some variation according to the precise circumstances under which the test had been sat and marked. This does not mean that pupils get ‘incorrect’ test results, but it does mean that some caution should be exercised in translating scores which are very close to the threshold mark into an overall mathematics level for the pupil. The level thresholds provided are indicative and teachers should be aware that differences in the status, administration and marking procedures open the tests to a potentially broader range of variation than the former statutory national curriculum tests.

Key findings and useful information

This section provides further support to teachers in making level-related judgements based on the outcomes of these tests.

Year 7 Paper 1

Question number (L4-6)	4
Question name	Groups
Marks	3
Programme of Study	Handling data
The question	<p>This question presents pupils with a table of data and asks them (a) to summarise it and then (b) and (c) to use the data to evaluate comments made about it.</p> <p>Pupils who answer item (a) correctly demonstrate an ability to read and summarise data from a table.</p> <p>Those who answer item (b) correctly are able to compare a statement about data with the data itself, identify why the statement is incorrect and explain their reasoning.</p> <p>Those answering (c) correctly show that they can take this skill further by manipulating data within a table in order to justify their explanation.</p>
Related teaching points	<p>Pupils answering all items correctly are ready to develop these skills further. They can be encouraged to interpret, evaluate and explain using more complex datasets.</p> <p>Those who answered item (a) incorrectly might need to practise reading data from straightforward tables, perhaps through gathering and presenting data that is meaningful to them. They might also be asked to work in small groups to devise and summarise simple datasets, or to identify errors in pre-prepared tables when compared with the source data.</p> <p>Those who answered items (b) or (c) incorrectly might need more practice in evaluating conclusions drawn from straightforward datasets. Concept cartoons could be used for this purpose (eg examples of four different conclusions that might be drawn from a dataset; pupils work together to agree the relative merits of each conclusion). Once familiar with this approach, pupils might devise their own concept cartoons for their peers to evaluate.</p>

Year 7 Paper 1

Question number (L4-6)	19
Question name	Shop
Marks	2
Programme of Study	Handling data
The question	<p>This question presents two charts based on the same dataset. Emma's chart shows all data but has no labels on the y axis, while Tami's chart has incomplete data and no labels on the x axis. Pupils are asked to use both charts to (a) give the time of the first data point on Tami's chart and (b) say how many people were in the shop at 1pm.</p> <p>Those who answer (a) correctly show that they can relate data presented in two different forms and use it to draw a relatively straightforward conclusion.</p> <p>Those who answer (b) correctly indicate that they understand how to relate the scales on different charts. They are likely to have used one of two strategies. Some might have simply read across the two charts. Others might have used their answer to part (a) to help them work out the answer to part (b).</p> <p>For both parts of this question, pupils have to make decisions about mathematical strategy.</p>
Related teaching points	<p>The question asks pupils to give answers but not to explain how they were derived. Pupils could be asked to make their strategies explicit, thus prompting reflection on alternative strategies.</p> <p>Pupils could be given different representations of various datasets and asked to compare them. This could be used to encourage reflection not only on how to interpret data, but also on potential dangers in trying to interpret data that is not clearly presented, thus making explicit the need for clarity in presentation.</p>

Year 7 Paper 2

Question number (L4-6)	13
Question name	Number shapes
Marks	2
Programme of Study	Number and algebra
The question	<p>Pupils are shown a number square numbered from 1 to 100 and told that Ben places a shape on the square and sums the numbers that fall inside the shape. They are then asked (a) what the total will be if he moves the shape one place to the left and (b) to calculate the least total he can make without going outside the grid, firstly if he does not rotate the shape and secondly if he does rotate the shape.</p> <p>Pupils answering this question correctly need to use their knowledge of number and calculation (or calculator skills), but also basic skills relating to spatial awareness.</p>
Related teaching points	<p>Potential errors in answering this question might arise from incorrectly translating the shape or from calculation errors. Pupils who make translation errors might benefit from further exploration of moving shapes around a grid, and using the language associated with such movement (eg left/right, clockwise/anticlockwise, rotate, etc).</p> <p>Pupils who make calculation errors might need more practice in using a calculator effectively (if they used one when answering this item). Alternatively, they might benefit from further practice in adding two-digit numbers based on recall and on using mental strategies associated with number squares. Some might also benefit from exploration of estimation strategies for checking answers.</p>

Year 7 Paper 2

Question number (L4-6)	20
Question name	Trip
Marks	3
Programme of Study	Number and algebra
The question	<p>This question relates to raising money for a camping trip, through selling greeting cards. Pupils are told the cost of the trip per person, the amount of money raised from each card sold and the number of cards sold in total each day for a week. They are then asked (a) how many cards must be sold by each person to raise the individual amount needed, and (b) how much money was raised in total during the week, by selling cards. Item (c) tells pupils that more money was raised and gives the final amount. Pupils then have to calculate how many people can afford to go camping.</p> <p>Pupils who answer these items correctly are able to select the relevant information from the question, make appropriate decisions about the calculations required, and make the relevant calculations accurately.</p>
Related teaching points	<p>A common error in part (b) is to make only a partial calculation (eg totalling the number of cards sold rather than the money raised by selling those cards). Pupils who make such errors might need further support in reviewing and evaluating their work, ensuring that they have actually reached an appropriate endpoint. More experience of multi-step problems might be useful. For example, pupils might be asked to devise explicit instructions for younger pupils on how to approach and solve a similar problem. These could then be trialled with fellow pupils, raising pupils' awareness of the steps involved, enabling them to refine their instructions and raising their awareness of how to process multi-step problems.</p> <p>A common error for item (c) is to give an answer that includes a decimal or fraction. This indicates that, while pupils have the necessary calculation skills, they have failed to account for the context of the question. Pupils may benefit from exploring contexts where whole numbers or fractions are appropriate. This might include classifying examples according to whether a fraction or whole number is necessary, optional or meaningless.</p>

Year 7 Paper 2

Question number (L4-6)	26
Question name	Pentagon
Marks	2
Programme of Study	Geometry and measures
The question	This question asks pupils to complete a drawing of an irregular equilateral pentagon. Three edges are given and pupils must add the remaining two edges. They are told to use a straight edge and a pair of compasses and to leave in their construction lines.
Related teaching points	<p>A common error is for pupils to fail to understand that the term ‘pentagon’ can apply to an irregular polygon as well as to the more easily recognised regular pentagon. Pupils who make this mistake may not attempt the question or might try to ‘regularise’ the shape (eg by making it symmetrical). Such pupils could benefit from activities that involve comparing and classifying shapes according to the number of sides, including regular and irregular shapes.</p> <p>Some pupils might use completion strategies other than those suggested. For example, they might use a ruler to make a series of measurements approximating the construction arc, rather than using a pair of compasses. In this context, such answers would receive credit where the resulting construction arc was sufficiently clear. However, pupils who use this strategy might need to explore how to work more efficiently using a pair of compasses.</p> <p>Pupils receiving partial credit for this item (ie those completing the shape accurately but with no construction arcs shown, or those giving construction arcs but adding two lines of an equal but incorrect length) might benefit from further activities requiring attention to detail when producing geometric diagrams.</p>

