

2018 national curriculum tests

# Key stage 2

## Mathematics test mark schemes

Paper 1: arithmetic

Paper 2: reasoning

Paper 3: reasoning



Standards  
& Testing  
Agency

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# 1. Introduction

The Standards and Testing Agency (STA) is responsible for the development and delivery of statutory tests and assessments. STA is an executive agency of the Department for Education.

The 2018 tests assess the national curriculum. This test has been developed to meet the specification set out in the [test framework](#)<sup>1</sup> for mathematics at key stage 2.

A new test and new mark schemes will be produced each year.

Key stage 2 tests are marked by external markers, who receive training to ensure the published mark schemes are applied consistently and fairly. The mark schemes are provided to show teachers how the tests are marked. The pupil examples are based on responses gathered from the test trialling process.

Scaled score conversion tables are not included in this document. Conversion tables will be produced as part of the standards maintenance process. [Scaled score conversion tables](#)<sup>2</sup> for the 2018 tests will be published in July 2018. The standards confirmation meeting will take place in June 2018.

## 2. Structure of the key stage 2 mathematics test

The test comprises:

- Paper 1: arithmetic (40 marks)
- Paper 2: reasoning (35 marks)
- Paper 3: reasoning (35 marks).

## 3. Content domain coverage

The 2018 test meets the specification in the test framework. Table 1 sets out the areas of the content domain that are assessed in papers 1, 2 and 3.

The references are taken from the test framework. A question assessing 4C7, for example, sets out to 'multiply two-digit and three-digit numbers by a one-digit number using a formal written layout' and is taken from the year 4 programme of study.

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1 [www.gov.uk/government/publications/key-stage-2-mathematics-test-framework](http://www.gov.uk/government/publications/key-stage-2-mathematics-test-framework)

2 [www.gov.uk/guidance/scaled-scores-at-key-stage-2](http://www.gov.uk/guidance/scaled-scores-at-key-stage-2)

**Table 1: Content domain coverage of the 2018 key stage 2 mathematics test**

Where two references are given, the primary reference is given first.

Paper 1: arithmetic		Paper 2: reasoning		Paper 3: reasoning	
Qu.	Content domain reference	Qu.	Content domain reference	Qu.	Content domain reference
1	3C2	1	4G2c	1	4N1, 6A3
2	3F4	2	3C3, 3C2	2	6A5
3	3C7	3	3M2a	3	5N3a
4	4C6b	4	4F2	4	5C2
5	4C6a	5a	6N5, 4S2	5	5C5a
6	4C6b	5b	6N5, 4S2	6	6S1
7	4C2	6	5N1	7a	5C7b
8	5C5d	7	4F6a, 4F6b	7b	5C7b
9	4F8	8	3C8, 3C6	8	6R2
10	3N2b	9	6N2	9	6R3
11	4C6b	10	6C6	10	6P3, 5G2a
12	4C6b	11	6G2b	11	3M9d, 4C4
13	5C6a	12	6P2, 4P3a	12	5N6, 6R1
14	4C2	13	5F2a	13	5M5, 5C8a
15	6N3	14	6F3, 6F2	14	6G4a, 4G2a
16	4F8, 4C2	15	5C8a, 5C7a	15a	6A2, 6C8
17	5F4	16	5C1	15b	6A2, 6C8
18	6F9a	17	5M9d, 5M5	16	4F10a
19	5F5	18	6S3, 6C8	17	5G3b, 6G3b
20	6C7a	19	6C3	18	6F4
21	6R2	20	6R1	19	6F9a, 5C6b
22	6C7b	21a	6A4	20	4C8, 3M4e
23	6F9b	21b	6A4	21a	5M4
24	6F4	22	6M8a	21b	5M4
25	6F4	23	5F5		
26	5F8				
27	6F9b				
28	6F4				
29	6C7a				
30	6R2				
31	6F5b				
32	6C9, 5C5d				
33	5F5				
34	6R2				
35	6F4				
36	6C7b				

## 4. Explanation of the mark schemes

The marking information for each question is set out in the form of tables (sections 7, 8 and 9).

The purpose of the mark scheme is to define the acceptable answers for each question within the test. Answers other than those listed may be acceptable if they meet the marking criteria.

The '**Qu.**' column on the left-hand side of each table provides a quick reference to the question number and part.

The '**Requirement**' column may include 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 an appropriate method
- examples of some different types of correct answer.

The '**Mark**' column indicates the total number of marks available for each question part.

The '**Additional guidance**' column indicates alternative acceptable answers and guidance, such as the range of acceptable answers, where necessary. This column may also provide details of specific types of answer which are unacceptable. For most questions, however, there will be unacceptable answers that are not listed.

## 5. General marking guidance

### 5.1 Applying the mark schemes

To ensure consistency of marking, the most frequent procedural queries are listed in section 5.2 along with the action the marker will take. This is followed by further guidance on pages 13 to 15 relating to marking questions involving money, time and other measures. Unless otherwise specified in the mark scheme, markers will apply these guidelines in all cases.

A small number of general marking principles have been expanded this year to clarify the guidance. This does not change the underlying principles or how they are applied.

#### Recording marks awarded

Pupils' test papers are scanned so that marking can be conducted on screen by trained markers.

For each question, markers record the award of 3, 2, 1 or 0 marks as appropriate, according to the mark scheme criteria. There is provision in the software to record questions not attempted. The software aggregates marks automatically.

## 5.2 General marking principles

Table 2: General marking principles for all papers

<b>1. The answer does not match closely any of the examples given in the mark scheme.</b>	Markers will use their judgement to decide whether the answer corresponds with details in the 'Requirement' column of the mark scheme. Reference will also be made to the 'Additional guidance' column.
<b>2. The answer is provided in a non-standard way.</b>	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 presenting an answer.
<b>3. The correct answer or working has been crossed out or erased and not replaced.</b>	The mark(s) will not be awarded for crossed-out or erased answers or working.
<b>4. More than one answer is given.</b>	If all answers given are correct (or a range of answers is given, all of which are correct), the mark(s) will be awarded unless the mark scheme states otherwise. If both correct and incorrect answers are given, the mark(s) will not be awarded unless the mark scheme states otherwise.
<b>5. No answer is given in the expected place, but the correct answer is given elsewhere.</b>	Where a pupil has unambiguously indicated the correct answer, the mark(s) will be awarded. In particular, where a word or number is expected, a pupil may meet the requirement by annotating a graph or labelling a diagram elsewhere in the question.
<b>6. The answer is correct, but the wrong working is shown.</b>	A correct final answer will be awarded the mark(s).
<b>7. The pupil has used alternative notation for a decimal point in a number.</b>	No alternative notation is accepted as representing a decimal point in a number, e.g. a comma.  Refer to section 6 for guidance on marking specific types of question.
<b>8. The pupil has used a symbol as a thousands separator.</b>	If the pupil has used a comma as a thousands separator (positioned either correctly or incorrectly) and the digits are in the correct order, then the mark(s) will be awarded.  If any other symbol, e.g. decimal point or apostrophe, is used, the mark(s) will not be awarded, although method marks may still be available.

<p><b>9. The answer in the answer box is wrong due to a transcription error.</b></p>	<p>A transcription error occurs when a pupil miscopies their answer from the end of their working into the answer box.</p> <p>Each part (integer, numerator, denominator) of a mixed number is considered separately when applying transcription error rules.</p> <p>Where appropriate, detailed guidance will be given in the mark scheme. For questions with no guidance, marks will only be awarded for a transcription error if the wrong answer is due to:</p> <ul style="list-style-type: none"> <li>transposed digits in a number (e.g. 243 is written as 324)</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>one digit changed in a number of 4 or more digits (e.g. 2,345 is written as 2,845).</li> </ul> <p>The mark(s) will not be awarded for any other transcription error including:</p> <ul style="list-style-type: none"> <li>a decimal point positioned incorrectly (e.g. 12.34 is written as 1.234 or 1234)</li> <li>a change by a power of 10 (e.g. 200 is written as 20 or 2,000)</li> <li>a digit added or removed (e.g. 123,456 written as 1233,456 or 12,456)</li> <li>a negative sign added or removed.</li> </ul>
<p><b>10. The answer is numerically or algebraically equivalent to the answer in the mark scheme.</b></p>	<p>Answers should be given as single values in their simplest form unless the mark scheme states otherwise, e.g. for <math>\square = 536 - 30</math>, the answer <math>500 + 6</math> will not be awarded the mark.</p> <p>For integer answers, e.g. 20, the answer <math>\frac{20}{1}</math> will be awarded the mark; <math>\frac{80}{4}</math> will not be awarded the mark.</p> <p>For decimal answers that include recurring digit(s), there must be an unambiguous indication of the recurring digit(s). For example, for <math>\frac{1}{6}</math>, <math>0.1\dot{6}</math> or <math>0.1\overline{6}</math> will be awarded the mark and for <math>\frac{1}{7}</math>, <math>0.14285\dot{7}</math> or <math>0.14285\overline{7}</math> will be awarded the mark.</p> <p>For fraction answers that can be expressed as a mixed number, the fraction paired with the integer must be a proper fraction, e.g. <math>1\frac{6}{4}</math> will not be awarded the mark although method marks may still be available.</p> <p>Where alternative responses are acceptable, this will be indicated in the 'Additional guidance' column.</p>

**Table 3: General marking principles for paper 1 only (arithmetic)**

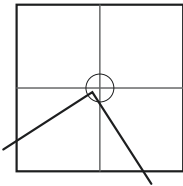
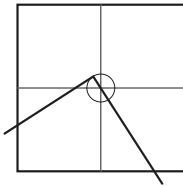
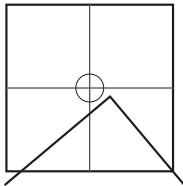
<b>11. The answer in the answer box is wrong due to a misread of numbers given in the question.</b>	<p>Misreads are not allowed in Paper 1; the mark(s) will not be awarded.</p>
<b>12. The pupil has not recorded their working beneath the given long multiplication or long division.</b>	<p>If a pupil carries out their working somewhere on the page other than beneath the given question as expected, then the pupil must start by rewriting the original question in order for it to be considered as a formal method.</p> <p>Please note that the operation sign does not need to be given for long multiplication, provided the pupil's working shows the intention to multiply.</p>
<b>13. The answer to the long division question expresses a remainder.</b>	<p>If a pupil reaches an integer answer using a formal method with no more than one arithmetic error, for example 25, then the mark(s) will be awarded for 25 r0 or 25.0, but the mark(s) will not be awarded for an answer of 250</p> <p>For answers with a remainder, the remainder must be expressed correctly.</p> <p>If a pupil shows a remainder that is the same size as the divisor or larger, for example, a remainder of 28 or 29 when dividing by 28, the mark(s) will not be awarded because the method is incomplete.</p> <p>If a pupil reaches a non-integer answer using a formal method with no more than one arithmetic error, for example when dividing by 28, the pupil reaches the answer 6 r14, then the mark(s) will be awarded for <math>6\frac{14}{28}</math> or 6.5, but the mark(s) will not be awarded for <math>6\text{ r}\frac{14}{28}</math> or 6.14 or 614</p>
<b>14. The long division method involves subtracting chunks of different sizes.</b>	<p>If a pupil's formal method involves subtracting chunks, it is not necessary to show a separate addition of the chunks. If the answer is not the correct total for their chunks, then that is treated as one arithmetic error.</p> <p>A method is considered as chunking when the size of the chunks are shown alongside the algorithm.</p> <p>It should be noted that this method will only be accepted if all chunks are of different sizes.</p>

Table 4: General marking principles for papers 2 and 3 only (reasoning)

<p><b>15. More than one method is given.</b></p>	<p>If a pupil gives more than one method, then the intended method is taken as the one which leads to the answer in the answer box or an identified answer elsewhere. If no answer is given, then all methods must be appropriate for the method mark(s) to be awarded.</p>
<p><b>16. There appears to be a misread of numbers or information given in the question that affects the pupil's working and/or explanation.</b></p>	<p>This occurs when a pupil misreads a number given in the question and consistently uses a different number that does not alter the original intention or difficulty of the question. For example, if 243 is misread and written as 248, both numbers may be regarded as comparable in difficulty. However, if 243 is misread and written as 245 or 240, the misread number may be regarded as making the question easier. The misread of a number may affect the award of marks. Any misread number must be seen, not implied.</p> <p>Where appropriate, detailed guidance will be given in the mark scheme. If no guidance is given, markers will examine each case to decide whether the mark(s) will be awarded.</p> <p>The mark(s) will not be awarded if:</p> <ul style="list-style-type: none"> <li>• it is a <b>ONE-mark</b> question</li> <li>• there is more than one misread number in a question</li> <li>• the mathematics is simplified</li> <li>• it is an 'explain' question</li> <li>• it is a misread of other information (not numbers)</li> <li>• the misread number is the same as any other number in the question.</li> </ul> <p>For <b>TWO-mark</b> questions that have a method mark, one mark will be awarded if an appropriate method is correctly followed through with the misread number to give the correct follow-through answer, provided the mathematics has not been simplified.</p> <p>For <b>THREE-mark</b> questions, refer to the additional guidance.</p>
<p><b>17. A misread or an arithmetic error results in an answer with multiple decimal places.</b></p>	<p>In some instances, a misread or an arithmetic error in a method leads to an answer with one or more decimal places. In such cases, the method mark(s) will be awarded for an answer that is correctly truncated or rounded provided the method is appropriate and the additional guidance does not specify otherwise. For example, 1.2345 is truncated to 1.2</p>

<p><b>18. The pupil has reversed values within a calculation involving subtraction or division.</b></p>	<p>When values within the calculation are reversed, the mark(s) will only be awarded when the answer corresponds to the correct calculation. For example, if the correct calculation is <math>12 \div 4</math>, the method mark(s) may be awarded for <math>4 \div 12 = 3</math>, but not for an answer other than 3</p> <p>Reversed values within a calculation are not acceptable in 'explain' questions.</p>
<p><b>19. The pupil omits an operation sign within their working.</b></p>	<p>If the correct sign of <math>+</math>, <math>-</math>, <math>\times</math>, or <math>\div</math> for an arithmetic operation is missing, then the mark(s) will only be awarded if the working shown by the pupil is clear enough to indicate that the required operation has been performed. This applies even if the results of the required operation are incorrect. For example, where the following is seen in working:</p> $\begin{array}{r} 456 \\ 123 \\ \hline \end{array}$ <ul style="list-style-type: none"> <li>• if the answer is larger than the greater of the given values, e.g. 679, then addition is implied</li> <li>• if the answer is less than the first given value, e.g. 323, then subtraction is implied.</li> </ul> <p>Where carrying or decomposition figures are seen, this is evidence of intention.</p>
<p><b>20. The pupil has used 'an appropriate method'.</b></p>	<p>For some questions, the mark scheme allows the award of the method mark(s) for 'evidence of an appropriate method', even if the answer is missing or incorrect. Refer to the 'Additional guidance' column where appropriate.</p> <p>For the award of the method mark(s) for an appropriate method, there must be evidence of <b>all</b> the steps of the appropriate method (i.e. any method that would lead to the correct answer if there were no arithmetic errors and no additional steps).</p> <p>This means that, for every step, either:</p> <ul style="list-style-type: none"> <li>• the appropriate calculation to be carried out must be shown</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>• if the calculation has not been written down, the correct answer or correct follow-through answer must be shown.</li> </ul> <p>Where the calculation shown would lead to a correct final answer, even if the processed numbers do not appear to be taken from the question, a method mark may be awarded unless the mark scheme specifies otherwise.</p>

<p><b>21. The pupil has used a trial and improvement method.</b></p>	<p>‘Trial and improvement’ is regarded as an acceptable method, unless the mark scheme states otherwise.</p> <p>For a ‘trial and improvement’ method to be awarded the method mark(s):</p> <ul style="list-style-type: none"> <li>• there must be at least 3 trials, carried out correctly, which all reduce the range in which the answer is known to lie</li> <li>• there can be additional trials, which are correctly or incorrectly carried out, and which may not reduce the range in which the answer is known to lie</li> <li>• a final answer is not needed, unless the mark scheme states otherwise.</li> </ul>
<p><b>22. The answer in the answer box is wrong but the correct answer is reached in the working.</b></p>	<p>Extra working occurs when a pupil writes the correct answer in their working, and then continues to process the information further.</p> <p>When the answer in the answer box is wrong and does not match the answer reached in the working, it is impossible to know why the pupil has written a different answer and it is assumed that extra working has occurred. GMP9 on transcription errors still applies.</p> <p>If the extra working does not contradict the pupil's appropriate method, the method mark(s) will be awarded.</p> <p>If the extra working contradicts the pupil's appropriate method, the method mark(s) will not be awarded.</p>
<p><b>23. The pupil miscopies a value from one part of their method into the next part.</b></p>	<p>There will be instances when a pupil reaches a value in their working, then restarts from a different value.</p> <p>The mark(s) will not be awarded if:</p> <ul style="list-style-type: none"> <li>• it is a <b>ONE-mark</b> question</li> <li>• there is more than one miscopy in the working</li> <li>• the miscopy does not follow transcription error rules (see GMP 9).</li> </ul> <p>The method mark(s) will only be awarded if an appropriate method is correctly shown using the miscopied number (which must follow transcription error rules).</p>

<p><b>24. The correct answer is embedded in the working.</b></p>	<p>An embedded answer occurs when a pupil shows the correct answer within their working but then selects the wrong answer from their working as their final answer or leaves the answer box blank. For example, if a pupil shows <math>2.5 \times 6 = 3 \times 5</math> in the last line of their working and writes 5 in the answer box, whereas the correct answer is 3, then this will affect the award of marks.</p> <p>Where appropriate, detailed guidance will be given in the mark scheme. If no guidance is given, markers will examine each case to decide whether the mark(s) will be awarded.</p> <p>For <b>ONE-mark</b> questions, the mark will not be awarded.</p> <p>For <b>TWO-mark</b> questions that have a method mark, one mark will be awarded, provided the pupil does not give redundant extra working that contradicts work already done or which adds to their appropriate method.</p> <p>For <b>THREE-mark</b> questions, refer to the additional guidance.</p>
<p><b>25. The phrase 'sight of' is used in the mark scheme.</b></p>	<p>For some questions, the mark scheme allows the mark(s) to be awarded for sight of a particular number or numbers within a method. Such numbers are the correct answers to partial steps within a method. The mark(s) will be awarded if the given value is written anywhere associated with that question.</p>
<p><b>26. The answer correctly follows through from earlier incorrect work.</b></p>	<p>'Follow-through' marks for an answer will only be awarded when specifically stated in the mark scheme.</p>
<p><b>27. The pupil has drawn lines which do not meet at the correct point.</b></p>	<p>Where the mark scheme states that 'slight inaccuracies in drawing' should be accepted, this means that the mark(s) will be awarded for responses marked within or on a circle of radius 2mm with its 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>

## 6. Marking specific types of question: summary of additional guidance

### 6.1 Answers involving money

	Accept	Do not accept
<p><b>Where the £ sign is given, e.g.</b></p> <p>£3.20, £7</p> <div>£</div>	<p>£3.20                      £7</p> <p>£7.00</p> <p>Any unambiguous indication of the correct amount, e.g.</p> <p>£3.20p</p> <p>£3 20 pence</p> <p>£3 20</p> <p>£3-20</p> <p>£3:20</p> <p>£3;20</p>	<p>Incorrect placement of pounds or pence, e.g.</p> <p>£320</p> <p>£320p</p> <p>Incorrect placement of decimal point or incorrect use or omission of 0 or use of comma as a decimal point, e.g.</p> <p>£3.2</p> <p>£3 200</p> <p>£32 0</p> <p>£3-2-0</p> <p>£3,20</p>
<p><b>Where the p sign is given, e.g.</b></p> <p>40p</p> <div>p</div>	<p>40p</p> <p>Any unambiguous indication of the correct amount, e.g.</p> <p>£0.40p</p> <p>0 40p</p> <p>£0-40p</p> <p>0:40p</p> <p>£0;40p</p>	<p>Incorrect or ambiguous use of pounds or pence or use of comma as a decimal point, e.g.</p> <p>0.40p</p> <p>£40p</p> <p>£0,40p</p>

	Accept	Do not accept
<b>Where a unit is not given, e.g.</b> £3.20, 40p <div style="border: 1px solid black; width: 80px; height: 20px; margin-top: 5px;"></div>	£3.20                      40p 320p                      £0.40 Any unambiguous indication of the correct amount, e.g. £3.20p                      £0.40 pence £3 20 pence              £0 40p £3 20                      £0-40 £3-20                      £0:40 £3:20                      £0;40 £3;20                      £.40 3.20                      0.40 320                      40 3 pounds 20	Incorrect or ambiguous use of pounds or pence or use of comma as a decimal point, e.g. £320                      £40 £320p                      £40p £3.2                      0.4 3.20p                      0.40p £3,20                      0,40 £0,40p

## 6.2 Answers involving time

	Accept	Do not accept
<b>A time interval, e.g.</b> 2 hours 30 minutes	2 hours 30 minutes Any unambiguous, correct indication, e.g. (0)2 h 30                      150 minutes (0)2 h 30 min              150 (0)2 30                      2.5 hours (0)2-30                      2 $\frac{1}{2}$ hours Digital electronic time, e.g. (0)2:30                      (0)2;30	Incorrect or ambiguous time interval or use of comma as a decimal point, e.g. 2.30                      230 2.3                      2.30 min 2.3 hours                      2,5 hours 2.3h                      2,30 2h 3

	Accept	Do not accept
<b>A specific time, e.g.</b> 8:40 am, 17:20	(0)8:40 am (0)8:40 twenty to nine Any unambiguous, correct indication, e.g. (0)8.40 (0)8;40 0840 (0)8 40 (0)8-40 Unambiguous change to 12 or 24-hour clock, e.g. 17:20 as 5:20 pm or 17:20 pm	Incorrect time, e.g. 8.4 am 8.40 pm Incorrect placement of separators, spaces, etc. or incorrect use or omission of 0 or use of a comma as a decimal point, e.g. 840 8:4:0 8.4 084 8,40

### 6.3 Answers involving measures

	Accept	Do not accept
<b>Where units are given, e.g.</b> 8.6 kg <div style="border: 1px solid black; padding: 2px; display: inline-block; margin: 2px;">kg</div> <div style="border: 1px solid black; padding: 2px; display: inline-block; margin: 2px;">m</div> <div style="border: 1px solid black; padding: 2px; display: inline-block; margin: 2px;">l</div>	8.6 kg Any unambiguous indication of the correct measurement, e.g. 8.60 kg 8.6000 kg 8 kg 600 g	Incorrect or ambiguous use of units or use of comma as a decimal point, e.g. 8600 kg 8 kg 600 8,60 kg 8,6000 kg

If a pupil gives an answer with a unit different from the unit in the answer box, then their answer must be equivalent to the correct answer provided, unless otherwise indicated in the mark scheme.

If a pupil leaves the answer box empty but writes the answer elsewhere on the page without any units, then that answer is assumed to have the units given in the answer box, subject to the conditions listed above.

## 7. Mark schemes for Paper 1: arithmetic

Qu.	Requirement	Mark	Additional guidance
1	712	1m	
2	$\frac{5}{11}$	1m	Accept equivalent fractions or an <b>exact</b> decimal equivalent, e.g. $0.\overline{45}$ (accept any unambiguous indication of the recurring digits).  <b>Do not</b> accept rounded or truncated decimals.
3	90	1m	
4	838	1m	
5	9	1m	
6	200	1m	
7	6,562	1m	
8	46	1m	
9	81.08	1m	
10	308	1m	
11	90	1m	
12	600	1m	
13	4	1m	
14	4,921	1m	
15	50,000	1m	
16	4.6	1m	
17	$\frac{6}{7}$	1m	Accept equivalent fractions or an <b>exact</b> decimal equivalent, e.g. $0.\overline{857142}$ (accept any unambiguous indication of the recurring digits).  <b>Do not</b> accept rounded or truncated decimals.
18	0.001	1m	Accept equivalent fractions, e.g. $\frac{1}{1000}$

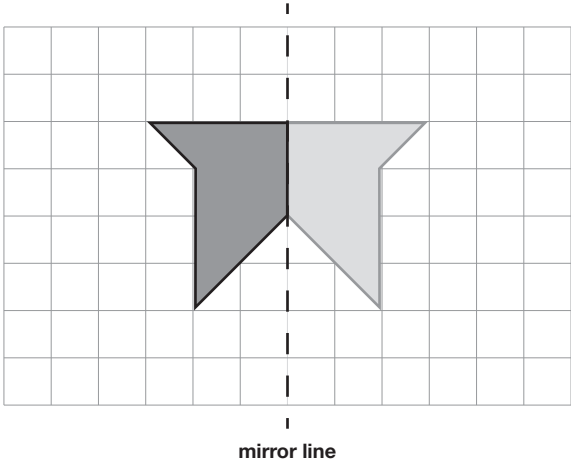
Qu.	Requirement	Mark	Additional guidance
19	750	1m	
20	<p>Award <b>TWO</b> marks for the correct answer of 18,055</p> <p>If the answer is incorrect, award <b>ONE</b> mark for a formal method of long multiplication with no more than <b>ONE</b> arithmetic error, e.g.</p> <p>•</p> $\begin{array}{r} 785 \\ \times 23 \\ \hline 2355 \\ 15700 \\ \hline 18155 \text{ (error)} \end{array}$ <p><b>OR</b></p> <p>•</p> $\begin{array}{r} 785 \\ \times 23 \\ \hline 2345 \text{ (error)} \\ 15700 \\ \hline 18045 \end{array}$	Up to 2m	<p>Working must be carried through to reach a final answer for the award of <b>ONE</b> mark.</p> <p><b>Do not</b> award any marks if the error is in the place value, e.g. the omission of the zero when multiplying by tens:</p> $\begin{array}{r} 785 \\ \times 23 \\ \hline 2355 \\ 1570 \text{ (place value error)} \\ \hline 3925 \end{array}$
21	240	1m	<b>Do not</b> accept 240%

Qu.	Requirement	Mark	Additional guidance
22	<p>Award <b>TWO</b> marks for the correct answer of 15</p> <p>If the answer is incorrect, award <b>ONE</b> mark for a formal method of division with no more than <b>ONE</b> arithmetic error, i.e.</p> <ul style="list-style-type: none"> <li>long division algorithm, e.g.</li> </ul> $\begin{array}{r} 14 \text{ (error)} \\ 43 \overline{) 645} \\ - 430 \\ \hline 215 \\ - 215 \\ \hline 0 \end{array}$ <p>OR</p> $\begin{array}{r} 15 \text{ r}28 \\ 43 \overline{) 645} \\ - 430 \qquad 10 \times 43 \\ \hline 215 \\ - 129 \qquad 3 \times 43 \\ \hline 114 \text{ (error)} \\ - 86 \qquad 2 \times 43 \\ \hline 28 \end{array}$ <ul style="list-style-type: none"> <li>short division algorithm, e.g.</li> </ul> $\begin{array}{r} 1 \ 5 \text{ r}3 \text{ (error)} \\ 43 \overline{) 64215} \end{array}$	Up to 2m	<p>Working must be carried through to reach a final answer for the award of <b>ONE</b> mark.</p> <p>Short division methods <b>must</b> be supported by evidence of appropriate carrying figures to indicate the use of a division algorithm, and be a complete method. The carrying figure <b>must</b> be less than the divisor.</p>
23	14	1m	
24	$\frac{7}{10}$	1m	Accept equivalent fractions or the <b>exact</b> decimal equivalent, e.g. 0.7
25	$2\frac{1}{2}$	1m	Accept equivalent mixed numbers, fractions or the <b>exact</b> decimal equivalent, e.g. 2.5
26	0.262	1m	
27	117	1m	

Qu.	Requirement	Mark	Additional guidance
28	$\frac{2}{3}$	1m	Accept equivalent fractions or an <b>exact</b> decimal equivalent, e.g. $0.\overline{6}$ (accept any unambiguous indication of the recurring digits).  <b>Do not</b> accept rounded or truncated decimals.
29	<p>Award <b>TWO</b> marks for the correct answer of 465,518</p> <p>If the answer is incorrect, award <b>ONE</b> mark for the formal method of long multiplication with no more than <b>ONE</b> arithmetic error, e.g.</p> <ul style="list-style-type: none"> <li> <math display="block">\begin{array}{r} 5413 \\ \times 86 \\ \hline 32478 \\ 433040 \\ \hline 465438 \text{ (error)} \end{array}</math> </li> <li>OR</li> <li> <math display="block">\begin{array}{r} 5413 \\ \times 86 \\ \hline 32478 \\ 423040 \text{ (error)} \\ \hline 455518 \end{array}</math> </li> </ul>	Up to 2m	<p>Working must be carried through to reach a final answer for the award of <b>ONE</b> mark.</p> <p><b>Do not</b> award any marks if the error is in the place value, e.g. the omission of the zero when multiplying by tens:</p> <ul style="list-style-type: none"> <li> <math display="block">\begin{array}{r} 5413 \\ \times 86 \\ \hline 32478 \\ 43304 \text{ (place value error)} \\ \hline 75782 \end{array}</math> </li> </ul>
30	198	1m	<b>Do not</b> accept 198%
31	$\frac{1}{8}$	1m	Accept equivalent fractions or an <b>exact</b> decimal equivalent, e.g. 0.125
32	77	1m	
33	60	1m	<b>Do not</b> accept unsimplified equivalent fractions unless accompanied by 60 or $\frac{60}{1}$
34	182	1m	<b>Do not</b> accept 182%
35	$2\frac{17}{21}$  OR $\frac{59}{21}$	1m	<p>Accept equivalent mixed numbers, fractions or the <b>exact</b> decimal equivalent, e.g. <math>2.\overline{809523}</math> (accept any unambiguous indication of the recurring digits).</p> <p><b>Do not</b> accept rounded or truncated decimals.</p>

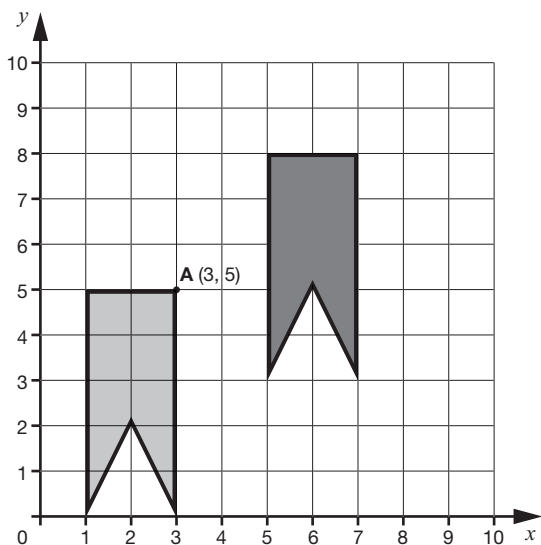
Qu.	Requirement	Mark	Additional guidance
36	<p>Award <b>TWO</b> marks for the correct answer of 91</p> <p>If the answer is incorrect, award <b>ONE</b> mark for the formal methods of division with no more than <b>ONE</b> arithmetic error, i.e.</p> <ul style="list-style-type: none"> <li>long division algorithm, e.g.</li> </ul> $  \begin{array}{r}  81 \text{ (error)} \\  97 \overline{) 8827} \\  - 8730 \\  \hline  97 \\  - 97 \\  \hline  0  \end{array}  $ <p><b>OR</b></p> $  \begin{array}{r}  91 \text{ r}2 \\  97 \overline{) 8827} \\  - 7760 \quad 80 \times 97 \\  \hline  1069 \text{ (error)} \\  - 970 \quad 10 \times 97 \\  \hline  99 \\  - 97 \quad 1 \times 97 \\  \hline  2  \end{array}  $ <ul style="list-style-type: none"> <li>short division algorithm, e.g.</li> </ul> $  \begin{array}{r}  7 \ 1 \text{ (error)} \\  97 \overline{) 882^9 7}  \end{array}  $	Up to 2m	<p>Working must be carried through to reach a final answer for the award of <b>ONE</b> mark.</p> <p>Sometimes an error in calculation leads to a remainder which equals the truncated decimal equivalent. In such cases when the remainder is expressed as a decimal, evidence of working leading to the decimal must be seen in order to condone the possible notation error. (See General Marking Principle 13, page 8.)</p> <p>Short division methods <b>must</b> be supported by evidence of appropriate carrying figures to indicate the use of a division algorithm, and be a complete method. The carrying figure <b>must</b> be less than the divisor.</p>

## 8. Mark schemes for Paper 2: reasoning

Qu.	Requirement	Mark	Additional guidance
1	<p>Diagram completed, as shown:</p>  <p style="text-align: center;">mirror line</p>	1m	<p>Accept slight inaccuracies in drawing (see page 12 for guidance).</p> <p>Shape need not be shaded for the award of <b>ONE</b> mark.</p>
2	<p>Correct addition calculation, as shown:</p> $\begin{array}{r} 28 \\ + 67 \\ \hline 95 \end{array}$ <p>OR</p> $\begin{array}{r} 67 \\ + 28 \\ \hline 95 \end{array}$	1m	All 6 digit cards must be completed correctly for the award of <b>ONE</b> mark.
3	A point on the line in the range 6.6cm to 6.8cm inclusive from A.	1m	
4	<p>Both values correct, as shown:</p> $\frac{3}{4} = \frac{9}{12} = \frac{18}{24}$	1m	Both values must be correct for the award of <b>ONE</b> mark.

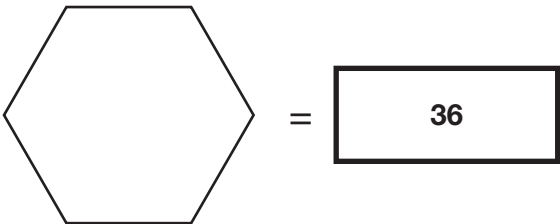
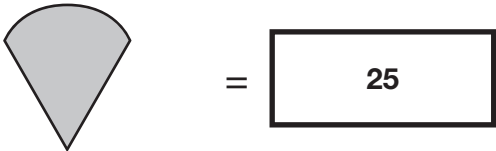
Qu.	Requirement	Mark	Additional guidance										
5a	7	1m	<b>Do not</b> accept −7 or 7−										
5b	Oslo	1m	Accept unambiguous abbreviations or recognisable misspellings.										
6	299,604	1m											
7	<p>Both boxes ticked, as shown:</p> <p style="text-align: center;">Tick <b>two</b>.</p> <table><tr><td>0.25</td><td><input checked="" type="checkbox"/></td></tr><tr><td>0.75</td><td><input type="checkbox"/></td></tr><tr><td><math>\frac{25}{100}</math></td><td><input checked="" type="checkbox"/></td></tr><tr><td>0.5</td><td><input type="checkbox"/></td></tr><tr><td><math>\frac{2}{5}</math></td><td><input type="checkbox"/></td></tr></table>	0.25	<input checked="" type="checkbox"/>	0.75	<input type="checkbox"/>	$\frac{25}{100}$	<input checked="" type="checkbox"/>	0.5	<input type="checkbox"/>	$\frac{2}{5}$	<input type="checkbox"/>	1m	<p>As pupils are told to select <b>two</b> boxes, alternative unambiguous positive indications, e.g. Y, of the correct answer are accepted.</p> <p>Both correct boxes must be ticked for the award of the mark. No additional boxes must be ticked.</p>
0.25	<input checked="" type="checkbox"/>												
0.75	<input type="checkbox"/>												
$\frac{25}{100}$	<input checked="" type="checkbox"/>												
0.5	<input type="checkbox"/>												
$\frac{2}{5}$	<input type="checkbox"/>												
8	<p>Award <b>TWO</b> marks for the correct answer of 192</p> <p>If the answer is incorrect, award <b>ONE</b> mark for evidence of an appropriate method, e.g.</p> <ul style="list-style-type: none"><li>• <math>48 \times 3 = 144</math> <math>24 \times 2 = 48</math> <math>144 + 48 =</math></li></ul> <p><b>OR</b></p> <ul style="list-style-type: none"><li>• <math>48 + 48 + 48 = 144</math> <math>24 + 24 = 48</math> <math>144 + 48 =</math></li></ul> <p><b>OR</b></p> <ul style="list-style-type: none"><li>• <math>4 \times 48</math></li></ul> <p><b>OR</b></p> <ul style="list-style-type: none"><li>• <math>8 \times 24</math></li></ul>	Up to 2m	<p>Answer need not be obtained for the award of <b>ONE</b> mark.</p>										

Qu.	Requirement	Mark	Additional guidance												
9	<p>Explanation that recognises that the sequence does not always increase by four, with clear reference to the data, e.g.</p> <ul style="list-style-type: none"><li>The difference between 1996 and 1999 is three years, not four so it is not always every four years</li><li>It would be 2000 if it was every 4 years</li><li>It should have ended in 2016</li></ul> <p><b>OR</b></p> <p>Explanation that demonstrates that the sequence does not always increase by 4, but does not reference specific years from the data, e.g.</p> <ul style="list-style-type: none"><li>The cricket world cup was sometimes 3 years apart instead of 4 years apart</li><li>Not all of the years have 4 years difference between.</li></ul>	1m	<p><b>Do not</b> accept vague or incomplete explanations, e.g.</p> <ul style="list-style-type: none"><li>It does not always increase by four</li><li>It should be 2000</li><li>The difference can be 3, 4 or 5 years at different times.</li></ul> <p><b>Do not</b> accept explanations which include incorrect mathematics or incorrect information that is relevant to the explanation, e.g.</p> <ul style="list-style-type: none"><li><math>1992 + 4 = 1996 + 3 = 1999</math></li></ul>												
10	<p>Award <b>TWO</b> marks for all symbols correct, as shown:</p> <table><tr><td><math>11 \times 12</math></td><td><math>&lt;</math></td><td><math>15 \times 10</math></td></tr><tr><td><math>90 \div 30</math></td><td><math>=</math></td><td><math>60 \div 20</math></td></tr><tr><td><math>120 \div 4</math></td><td><math>&gt;</math></td><td><math>160 \div 8</math></td></tr><tr><td><math>30 \times 8</math></td><td><math>&lt;</math></td><td><math>100 \times 10</math></td></tr></table> <p>Award <b>ONE</b> mark for any three symbols correct.</p>	$11 \times 12$	$<$	$15 \times 10$	$90 \div 30$	$=$	$60 \div 20$	$120 \div 4$	$>$	$160 \div 8$	$30 \times 8$	$<$	$100 \times 10$	Up to 2m	
$11 \times 12$	$<$	$15 \times 10$													
$90 \div 30$	$=$	$60 \div 20$													
$120 \div 4$	$>$	$160 \div 8$													
$30 \times 8$	$<$	$100 \times 10$													
11	<p>Award <b>TWO</b> marks for the table completed, as shown:</p> <table><tr><td>Number of faces</td><td>Number of vertices</td><td>Number of edges</td></tr><tr><td>6</td><td>8</td><td>12</td></tr></table> <p>Award <b>ONE</b> mark for two correct numbers, correctly placed.</p>	Number of faces	Number of vertices	Number of edges	6	8	12	Up to 2m							
Number of faces	Number of vertices	Number of edges													
6	8	12													

Qu.	Requirement	Mark	Additional guidance
12	Shape located correctly, as shown: 	1m	Accept slight inaccuracies in drawing (see page 12 for guidance).  Shape need not be shaded for the award of <b>ONE</b> mark.
13	Correct number circled, as shown: $\frac{67}{8} \quad \frac{48}{8} \quad \frac{62}{8} \quad \left( \frac{55}{8} \right) \quad \frac{76}{8}$	1m	Accept alternative unambiguous positive indication of the correct answer, e.g. fraction ticked.
14	Fractions written in the correct order, as shown: $\frac{3}{5} \quad \frac{3}{4} \quad \frac{6}{5}$	1m	Accept the fraction joined to the correct box, rather than written in it.  <b>Do not</b> accept transcription errors or misreads for this question.

Qu.	Requirement	Mark	Additional guidance
15	<p>Award <b>TWO</b> marks for the correct answer of 1800</p> <p>If the answer is incorrect, award <b>ONE</b> mark for evidence of appropriate complete method with no more than one arithmetic error, e.g.</p> <ul style="list-style-type: none"> <li><math>40 \times 15 = 500</math> (error)</li> <li><math>500 \times 3 = 1500</math></li> </ul> <p>If no answer is given, the first part of the calculation must be evaluated correctly for the award of <b>ONE</b> mark, e.g.</p> <ul style="list-style-type: none"> <li><math>15 \times 3 = 45</math></li> <li><math>45 \times 40 =</math></li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li><math>40 \times 15 = 600</math></li> <li><math>600 \times 3 =</math></li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li><math>40 \times 3 = 120</math></li> <li><math>120 \times 15 =</math></li> </ul>	Up to 2m	<p><b>Do not</b> accept sight of a correct multiplication, e.g. <math>40 \times 15 \times 3</math>, for <b>ONE</b> mark unless part of the calculation is evaluated correctly.</p> <p>Misreads are <b>not</b> allowed.</p>
16	<p>Award <b>TWO</b> marks for two boxes ticked correctly, as shown:</p> <p>add 3 then subtract 90 <input type="checkbox"/></p> <p>subtract 100 then add 3 <input checked="" type="checkbox"/></p> <p>subtract 7 then subtract 90 <input checked="" type="checkbox"/></p> <p>subtract 3 then subtract 100 <input type="checkbox"/></p> <p>If the answer is incorrect, award <b>ONE</b> mark for:</p> <ul style="list-style-type: none"> <li>only one box ticked correctly and no incorrect boxes ticked</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>two boxes ticked correctly and one incorrect box ticked.</li> </ul>	Up to 2m	Accept alternative unambiguous positive indication of the correct answer, e.g. Y.

Qu.	Requirement	Mark	Additional guidance
17	<p>Award <b>THREE</b> marks for the correct answer of 1.7 (litres) or 1,700 (ml).</p> <p>If the answer is incorrect, award <b>TWO</b> marks for:</p> <ul style="list-style-type: none"> <li>sight of 6,300 <b>OR</b> 6.3 as evidence of the multiplication completed correctly</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>evidence of an appropriate complete method with no more than one error, e.g.</li> </ul> <ul style="list-style-type: none"> <li><math>28 \times 225 = 6,300</math> 8 litres = 8,000 ml <math>8,000 - 6,300 = 2,700</math> (error)</li> </ul> <p>Award <b>ONE</b> mark for evidence of an appropriate method, e.g.</p> <ul style="list-style-type: none"> <li><math>8,000 - 28 \times 225 =</math></li> </ul>	Up to 3m	<p>Unit need not be given for the award of <b>THREE</b> marks. An incorrect unit is treated as <b>one</b> error.</p> <p>A misread may affect the award of marks. No marks are awarded if there is more than one misread or if the mathematics is simplified.</p> <p><b>TWO</b> marks will be awarded for an appropriate complete method with the misread number followed through correctly.</p> <p><b>ONE</b> mark will be awarded for evidence of an appropriate complete method with the misread number followed through correctly with one arithmetic error.</p> <p>If the answer reached in the first part of the calculation gives an answer greater than 8(L) or 8000(ml) and the smaller value is then subtracted from it, <b>ONE</b> mark may still be available.</p> <p>Answer need not be obtained for the award of <b>ONE</b> mark.</p>
18	<p>Award <b>TWO</b> marks for the correct answer of £5.50</p> <p>If the answer is incorrect, award <b>ONE</b> mark for:</p> <ul style="list-style-type: none"> <li>sight of <math>22 \div 4</math></li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>evidence of appropriate method, e.g.</li> </ul> <ul style="list-style-type: none"> <li>3 tickets cost <math>3 \times £5 = £15</math> 1 ticket costs £7 <math>£15 + £7 = £22</math> <math>£22 \div 2 \div 2</math></li> </ul>	Up to 2m	<p>For <b>ONE</b> mark, accept an answer of £550, £550p or £5.5 as evidence of appropriate method.</p> <p>Answer need not be obtained for the award of <b>ONE</b> mark.</p>

Qu.	Requirement	Mark	Additional guidance
19	<p>Third box only ticked correctly, as shown:</p> <p> <math>3 - 2 + 2</math> <input type="checkbox"/> </p> <p> <math>4 - 2 + 1</math> <input type="checkbox"/> </p> <p> <math>4 - 2 + 2</math> <input checked="" type="checkbox"/> </p> <p> <math>3 - 2 + 1</math> <input type="checkbox"/> </p>	1m	Accept alternative unambiguous positive indication of the correct answer, e.g. Y.
20	<p>Award <b>TWO</b> marks for the correct answer of 30</p> <p>If the answer is incorrect, award <b>ONE</b> mark for evidence of an appropriate method, e.g.</p> <ul style="list-style-type: none"> <li><math>17.5 \times 12 = 210</math></li> <li><math>15 \times 12 = 180</math></li> <li><math>210 - 180 =</math></li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li><math>2.5 \times 12 =</math></li> </ul>	Up to 2m	Answer need not be obtained for the award of <b>ONE</b> mark.
21a		1m	
21b		1m	<p>Award <b>ONE</b> mark for an answer of</p> <ul style="list-style-type: none"> <li><math>(147 - 2 \times \text{answer for box 1}) \div 3</math></li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li><math>(111 - \text{answer for box 1}) \div 3</math></li> </ul> <p>Any follow-through fraction or decimal answer must be expressed as an exact value.</p>
22	125	1m	

Qu.	Requirement	Mark	Additional guidance
23	<p>Award <b>TWO</b> marks for the correct answer of 1,408</p> <p><b>OR</b></p> <p>for an answer in the range of 1,406 to 1,409 inclusive.</p> <p>If the answer is incorrect, award <b>ONE</b> mark for:</p> <ul style="list-style-type: none"> <li>sight of 1,392</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>evidence of an appropriate method, e.g. <ul style="list-style-type: none"> <li><math>24 \times 58 \frac{2}{3} = \text{answer}</math></li> <li><math>24 \times 58 = 1,394</math> (<i>error</i>)  <math>\frac{2}{3}</math> of 24 = 16  <math>1,394 + 16 = \text{answer}</math></li> <li><math>24 \times \frac{176}{3} = \text{answer}</math></li> <li><math>24 \times 58.67 = \text{answer.}</math></li> </ul> </li> </ul>	Up to 2m	<p>A final answer is required for the award of <b>ONE</b> mark.</p> <p>Within an appropriate method, if a decimal equivalent for <math>\frac{2}{3}</math> is given, it must be rounded or truncated to at least 2 decimal places.</p>

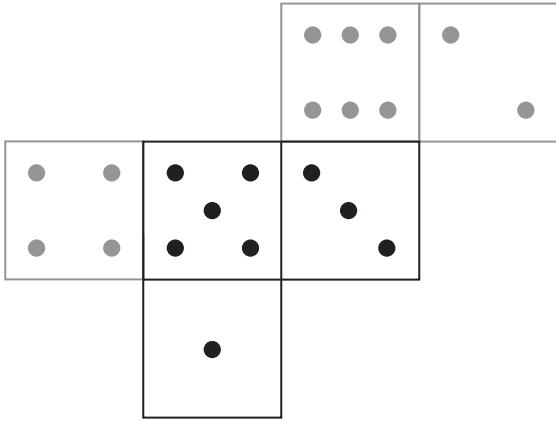
## 9. Mark schemes for Paper 3: reasoning

Qu.	Requirement	Mark	Additional guidance
1	<p>Award <b>TWO</b> marks for three correct numbers, as shown:</p> <div><div>35</div> 42      49    <div>56</div> 63    <div>70</div></div> <p>Award <b>ONE</b> mark for two numbers correctly placed.</p>	Up to 2m	
2	<p>Two combinations, as shown:</p> <p>blue and red <b>OR</b> red and blue</p> <p><b>AND</b></p> <p>white and red <b>OR</b> red and white.</p>	1m	
3	<p>Digits in correct order, as shown:</p> <div><div>2</div><div>7</div><div>4</div><div>3</div></div>	1m	All digits must be in the correct order for the award of <b>ONE</b> mark.
4	<p>Award <b>TWO</b> marks for numbers completed, as shown:</p> <div><div><div>5</div><div>3</div><div>2</div><div>4</div><div>9</div></div><div>+</div><div><div>7</div><div>4</div><div>2</div><div>7</div></div><div><div>6</div><div>0</div><div>6</div><div>7</div><div>6</div></div></div> <p>Award <b>ONE</b> mark for any two numbers completed correctly.</p>	Up to 2m	

Qu.	Requirement	Mark	Additional guidance
5	<p>Award <b>TWO</b> marks for only three correct boxes ticked, as shown:</p> <p>2 <input checked="" type="checkbox"/></p> <p>3 <input checked="" type="checkbox"/></p> <p>6 <input checked="" type="checkbox"/></p> <p>9 <input type="checkbox"/></p> <p>12 <input type="checkbox"/></p> <p>Award <b>ONE</b> mark for:</p> <ul style="list-style-type: none"> <li>only two correct boxes ticked and no incorrect boxes ticked</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>three correct boxes ticked and one incorrect box ticked.</li> </ul>	Up to 2m	Accept alternative unambiguous positive indications, e.g. Y.
6	<p>Award <b>TWO</b> marks for only two correct boxes ticked, as shown:</p> <p>There are more cheetahs than jaguars. <input checked="" type="checkbox"/></p> <p>The total number of lions and tigers is 10 <input type="checkbox"/></p> <p>One-quarter of the big cats are cheetahs. <input checked="" type="checkbox"/></p> <p>There are more than 5 jaguars. <input type="checkbox"/></p> <p>Award <b>ONE</b> mark for:</p> <ul style="list-style-type: none"> <li>only one correct box ticked and no incorrect boxes ticked</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>two correct boxes ticked and one incorrect box ticked.</li> </ul>	Up to 2m	Accept alternative unambiguous positive indications, e.g. Y.

Qu.	Requirement	Mark	Additional guidance
<b>7a</b>	163	<b>1m</b>	
<b>7b</b>	2	<b>1m</b>	
<b>8</b>	£140	<b>1m</b>	<b>Do not</b> accept 140%
<b>9</b>	108	<b>1m</b>	
<b>10</b>	(-3,1)	<b>1m</b>	<b>Do not</b> accept (3-, 1)
<b>11</b>	<p>Award <b>TWO</b> marks for a correct answer of 275</p> <p><b>OR</b></p> <p>an answer in the range from 270 to 280 inclusive.</p> <p>If the answer is incorrect, award <b>ONE</b> mark for evidence of appropriate method, e.g.</p> <ul style="list-style-type: none"> <li><math>150 + 175 = 325</math> <math>600 - 325 =</math></li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li><math>600 - 150 - 165</math> (error) =</li> </ul>	<b>Up to 2m</b>	<p>Answer need not be obtained for the award of <b>ONE</b> mark.</p> <p>Accept a reading in the range 170 to 180 ml inclusive for the second jug.</p> <p>At least one of the measurements must be correct for the award of <b>ONE</b> mark.</p>
<b>12</b>	24	<b>1m</b>	
<b>13</b>	<p>Award <b>TWO</b> marks for the correct answer of 40</p> <p>If the answer is incorrect, award <b>ONE</b> mark for evidence of appropriate method, e.g.</p> <ul style="list-style-type: none"> <li><math>2.6 \times 1,000 = 2,600</math> <math>2,600 \div 65 =</math></li> <li><math>2.6 \div 0.065 =</math></li> </ul>	<b>Up to 2m</b>	<p>Answer need not be obtained for the award of <b>ONE</b> mark.</p> <p><b>Do not</b> accept an incorrect conversion or no conversion of units, e.g.</p> <ul style="list-style-type: none"> <li><math>260 \div 65 =</math></li> <li><math>2.6 \text{ kg} \div 65 \text{ g}</math></li> </ul>

Qu.	Requirement	Mark	Additional guidance
14	<p>An explanation showing an understanding:</p> <ul style="list-style-type: none"> <li>that this specific triangle has angles 70, 70 and 40</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>of the properties of an equilateral triangle – all angles are equal (<math>60^\circ</math>)</li> </ul> <p>and therefore that this triangle cannot be equilateral, e.g.</p> <ul style="list-style-type: none"> <li>The angles aren't <math>60^\circ</math></li> <li>There is not a <math>60^\circ</math> angle</li> <li>It has two different angles (<math>70^\circ</math> and <math>40^\circ</math>) so it can't be equilateral</li> <li>The angles aren't the same</li> <li>An equilateral triangle has <math>60^\circ + 60^\circ + 60^\circ</math></li> <li>All the angles are the same in an equilateral triangle</li> <li>It's an isosceles triangle.</li> </ul> <p>(In the context of this question, the term isosceles triangle is treated as not including equilateral triangles as a special type, as the national curriculum does not specify this at key stage 2.)</p>	1m	<p><b>Do not</b> accept vague or incomplete explanations, e.g.</p> <ul style="list-style-type: none"> <li>The other angle is <math>70^\circ</math></li> <li>They aren't (all) the same. <i>(No reference to angles)</i></li> <li>An equilateral triangle has equal angles. <i>(Does not say all.)</i></li> </ul> <p><b>Do not</b> accept explanations which include incorrect mathematics or incorrect information that is relevant to the explanation, e.g.</p> <ul style="list-style-type: none"> <li><math>40 + 70 = 110 + 70 = 180</math></li> </ul>
15a	£3.05	1m	Refer to page 13 for additional guidance on marking answers involving money.
15b	<p>Award <b>TWO</b> marks for the correct answer of 6</p> <p>If the answer is incorrect, award <b>ONE</b> mark for evidence of an appropriate method, e.g.</p> <ul style="list-style-type: none"> <li><math>£5 - £1.25 = £3.75</math>  <math>£3.75 \div 60p = 6.25</math>  7 colours <i>(rounded incorrectly)</i></li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li><math>£5 - £1.25 = £4.75</math> <i>(error)</i>  <math>475 \div 60 =</math></li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li><math>6 \times 60 = 360</math>  <math>£3.60 + £1.25 = £4.85</math>  7 colours <i>(rounded incorrectly)</i></li> </ul>	Up to 2m	<p>Answer need not be obtained for the award of <b>ONE</b> mark.</p>

Qu.	Requirement	Mark	Additional guidance
16	<p>Award <b>TWO</b> marks for the correct answer of 184</p> <p>If the answer is incorrect, award <b>ONE</b> mark for:</p> <ul style="list-style-type: none"> <li>sight of 92</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>evidence of appropriate method, e.g.</li> <li><math>\frac{1}{3} \times 276 = 92</math></li> <li><math>92 \times 2 =</math></li> <li><math>276 \div 3 = 92</math></li> <li><math>276 - 92 =</math></li> </ul>	<b>Up to 2m</b>	Answer need not be obtained for the award of <b>ONE</b> mark.
17	<p>Net completed, as shown:</p> 	<b>1m</b>	<p>Accept unconventional arrangements of the dots, provided the intended number is clear and correct.</p> <p>Accept numbers instead of dots.</p>

Qu.	Requirement	Mark	Additional guidance
18	<p>Award <b>TWO</b> marks for the correct answer of <math>\frac{1}{12}</math> or an equivalent fraction.</p> <p>If the answer is incorrect, award <b>ONE</b> mark for:</p> <ul style="list-style-type: none"> <li>sight of <math>\frac{11}{12}</math></li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>evidence of appropriate method, e.g.</li> <li><math>\frac{2}{3} + \frac{1}{4}</math></li> <li><math>\frac{8}{12} + \frac{3}{12} = \frac{10}{12}</math> (error)</li> <li><math>1 - \frac{10}{12} =</math></li> <li><math>1 - \frac{2}{3} - \frac{1}{4} =</math></li> </ul>	Up to 2m	Answer need not be obtained for the award of <b>ONE</b> mark.
19	<p>Award <b>TWO</b> marks for numbers completed, as shown:</p> <p><math>354 \times 9.5 =</math> <span style="border: 1px solid black; padding: 2px 10px;">3,363</span></p> <p><math>3,540 \times 95 =</math> <span style="border: 1px solid black; padding: 2px 10px;">336,300</span></p> <p><math>3,363 \div 95 =</math> <span style="border: 1px solid black; padding: 2px 10px;">35.4</span></p> <p>Award <b>ONE</b> mark for any two numbers completed correctly.</p>	Up to 2m	<b>Do not</b> accept transcription errors or misreads for this question.
20	<p>Award <b>TWO</b> marks for the correct answer of 101</p> <p>If the answer is incorrect, award <b>ONE</b> mark for:</p> <ul style="list-style-type: none"> <li>sight of 44</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>evidence of appropriate method, e.g.</li> <li><math>31 - 20 = 11</math></li> <li><math>11 \times 4 + 57 =</math></li> </ul>	Up to 2m	Answer need not be obtained for the award of <b>ONE</b> mark.

Qu.	Requirement	Mark	Additional guidance
<b>21a</b>	57 min 15 sec	<b>1m</b>	The answer is a time interval (see page 14 for guidance).
<b>21b</b>	44 min 40 sec	<b>1m</b>	

2018 key stage 2 mathematics test mark schemes

Paper 1: arithmetic, Paper 2: reasoning and Paper 3: reasoning

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