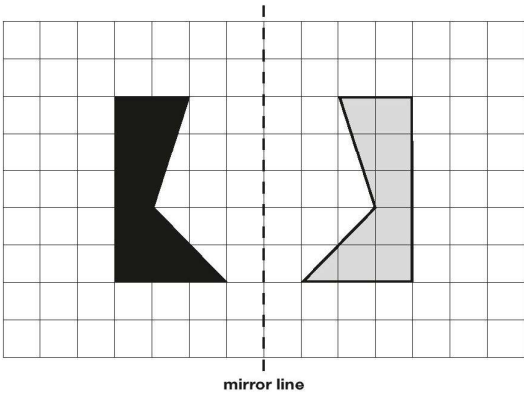


## 8. Mark schemes for Paper 2: reasoning

Qu.	Requirement	Mark	Additional guidance																									
1	Award <b>ONE</b> mark for three correct answers, as shown: <table border="1" style="margin: 10px auto; border-collapse: collapse;"> <tr> <td style="padding: 5px;">4</td> <td style="padding: 5px;">×</td> <td style="padding: 5px;">8</td> <td style="padding: 5px;">=</td> <td style="padding: 5px; border: 2px solid black;"><b>32</b></td> </tr> <tr> <td style="padding: 5px;">×</td> <td style="padding: 5px; background-color: #cccccc;"></td> <td style="padding: 5px;">×</td> <td colspan="2" style="padding: 5px; background-color: #cccccc;"></td> </tr> <tr> <td style="padding: 5px;">3</td> <td style="padding: 5px;">×</td> <td style="padding: 5px; border: 2px solid black;"><b>7</b></td> <td style="padding: 5px;">=</td> <td style="padding: 5px;">21</td> </tr> <tr> <td style="padding: 5px;">=</td> <td colspan="2" style="padding: 5px; background-color: #cccccc;"></td> <td style="padding: 5px;">=</td> <td colspan="1" style="padding: 5px; background-color: #cccccc;"></td> </tr> <tr> <td style="padding: 5px; border: 2px solid black;"><b>12</b></td> <td colspan="2" style="padding: 5px; background-color: #cccccc;"></td> <td style="padding: 5px;">56</td> <td colspan="1" style="padding: 5px; background-color: #cccccc;"></td> </tr> </table>	4	×	8	=	<b>32</b>	×		×			3	×	<b>7</b>	=	21	=			=		<b>12</b>			56		1m	
4	×	8	=	<b>32</b>																								
×		×																										
3	×	<b>7</b>	=	21																								
=			=																									
<b>12</b>			56																									
2	8,072	1m																										
3	Award <b>ONE</b> mark for the four numbers matched correctly, as shown: <table style="margin: 10px auto; border-collapse: collapse;"> <tr> <td style="border: 1px solid black; padding: 5px; width: 100px;">1,009,909</td> <td style="width: 100px;"></td> <td style="border: 1px solid black; padding: 5px; width: 50px;">1<sup>st</sup></td> <td style="padding: 5px;">largest</td> </tr> <tr> <td style="border: 1px solid black; padding: 5px;">1,023,065</td> <td style="width: 100px;"></td> <td style="border: 1px solid black; padding: 5px;">2<sup>nd</sup></td> <td></td> </tr> <tr> <td style="border: 1px solid black; padding: 5px;">1,009,099</td> <td style="width: 100px;"></td> <td style="border: 1px solid black; padding: 5px;">3<sup>rd</sup></td> <td></td> </tr> <tr> <td style="border: 1px solid black; padding: 5px;">1,230,650</td> <td style="width: 100px;"></td> <td style="border: 1px solid black; padding: 5px;">4<sup>th</sup></td> <td style="padding: 5px;">smallest</td> </tr> </table>	1,009,909		1 <sup>st</sup>	largest	1,023,065		2 <sup>nd</sup>		1,009,099		3 <sup>rd</sup>		1,230,650		4 <sup>th</sup>	smallest	1m	Lines need not touch the numbers and ordinals, provided the intention is clear.  <b>Do not</b> accept any number which has been matched to more than one ordinal.									
1,009,909		1 <sup>st</sup>	largest																									
1,023,065		2 <sup>nd</sup>																										
1,009,099		3 <sup>rd</sup>																										
1,230,650		4 <sup>th</sup>	smallest																									

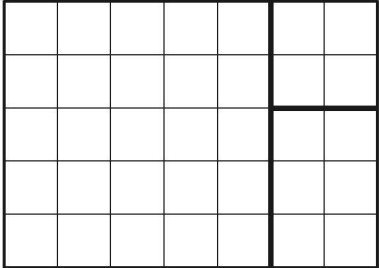
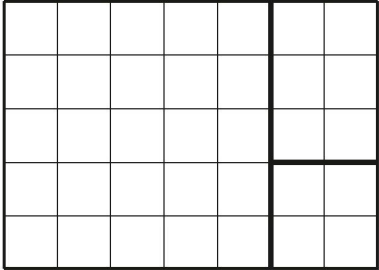
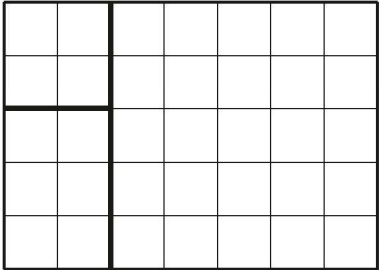
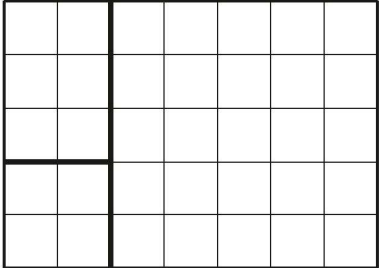
Qu.	Requirement	Mark	Additional guidance
4	<p>Diagram completed, as shown:</p>  <p style="text-align: center;">mirror line</p>	1m	<p>Accept slight inaccuracies in drawing (see page 13 for guidance).</p> <p>Shape need not be shaded for the award of <b>ONE</b> mark.</p>
5	<p>Award <b>TWO</b> marks for three correct numbers, as shown:</p> <p><input type="text" value="110"/> 155    200    245    <input type="text" value="290"/>    <input type="text" value="335"/></p> <p>Award <b>ONE</b> mark for:</p> <ul style="list-style-type: none"> <li>any two numbers correctly placed</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>if box 1 is correct, accept correct follow-through for box 3 from the incorrect value in box 2.</li> </ul>	Up to 2m	Do not accept misreads for this question.
6	10	1m	
7	2.5 or $2\frac{1}{2}$	1m	Refer to section 6.3 on page 16 for additional guidance on marking answers involving measures.
8a	<p>11 written in the first box, as shown:</p> <p><input type="text" value="11"/>    <input type="text" value="25"/>    <input type="text" value="53"/>    <input type="text"/></p>	1m	
8b	<p>109 written in the last box, as shown:</p> <p><input type="text"/>    <input type="text" value="25"/>    <input type="text" value="53"/>    <input type="text" value="109"/></p>	1m	
9	<p>Award <b>TWO</b> marks for the correct answer of 124</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>953 - 85 = 868</math> <math>868 \div 7</math></li> </ul>	Up to 2m	<p>Answer need not be obtained for the award of <b>ONE</b> mark.</p> <p>If the pupil's evaluation contradicts the appropriate method, the method mark will not be awarded.</p>

Qu.	Requirement	Mark	Additional guidance
10	Second box only ticked correctly, as shown:  number of tickets $\times 3 + 24$ <input type="checkbox"/>  number of tickets $\times 24 + 3$ <input checked="" type="checkbox"/>  number of tickets $+ 3 \times 24$ <input type="checkbox"/>  number of tickets $+ 24 \times 3$ <input type="checkbox"/>	1m	Accept alternative unambiguous positive indication of the correct answer, e.g. Y.
11a	0.25	1m	<b>Do not</b> accept $\frac{1}{4}$ or any other fraction. Refer to section 6.3 on page 16 for additional guidance on marking answers involving measures.
11b	65(p) <b>OR</b> (£)0.65	1m	Refer to section 6.1 on pages 14 and 15 for additional guidance on marking answers involving money.
12	Both symbols correct, as shown:  $\frac{7}{10}$ <input type="checkbox"/> $>$ 0.07  $\frac{23}{1000}$ <input type="checkbox"/> $<$ 0.23	1m	

Qu.	Requirement	Mark	Additional guidance								
13	<p>Award <b>TWO</b> marks for a completed triangle that has <b>all</b> of the following three points:</p> <ul style="list-style-type: none"> <li>an angle in the range <math>33^\circ</math> to <math>37^\circ</math> inclusive for the angle marked <math>35^\circ</math></li> <li>an angle in the range <math>88^\circ</math> to <math>92^\circ</math> inclusive for the right angle</li> <li>the triangle has been drawn on an 8cm line (either on the given line or a line drawn), provided they have constructed both angles within the tolerance of the line 7.9cm to 8.1cm.</li> </ul> <p>If the answer is incorrect, award <b>ONE</b> mark for a completed triangle and two of the three points correct.</p>	Up to 2m	<p>Accept drawings where any side has been extended past a vertex.</p> <p>When considering whether the triangle is completed, <b>do not</b> accept:</p> <ul style="list-style-type: none"> <li>a quadrilateral or another shape drawn</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>a curved line that is used to complete the shape</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>sides not meeting to form a vertex.</li> </ul>								
14	<p>Award <b>TWO</b> marks for the correct completion of the three numbers in the table, as shown:</p> <table border="1"> <tr> <td></td> <td>Round 39,476</td> </tr> <tr> <td>to the nearest 10,000</td> <td><b>40,000</b></td> </tr> <tr> <td>to the nearest 1,000</td> <td><b>39,000</b></td> </tr> <tr> <td>to the nearest 100</td> <td><b>39,500</b></td> </tr> </table> <p>If the answer is incorrect, award <b>ONE</b> mark for <b>any two</b> of the numbers rounded correctly.</p>		Round 39,476	to the nearest 10,000	<b>40,000</b>	to the nearest 1,000	<b>39,000</b>	to the nearest 100	<b>39,500</b>	Up to 2m	Do not accept 9,000 or 500 for the second and third entries.
	Round 39,476										
to the nearest 10,000	<b>40,000</b>										
to the nearest 1,000	<b>39,000</b>										
to the nearest 100	<b>39,500</b>										
15	25	1m									
16	4	1m									

Qu.	Requirement	Mark	Additional guidance
17	<p>Award <b>TWO</b> marks for the correct answer of 144</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>8 \times 6 = 48</math></li> <li><math>48 \div 4 = 13</math> (<i>error</i>)</li> <li><math>13 \times 13 = 169</math></li> </ul> <p><b>OR</b></p> <p>Award <b>ONE</b> mark for:</p> <ul style="list-style-type: none"> <li>evidence for the side length of the square calculated correctly, i.e. 12</li> </ul>	Up to 2m	Answer need not be obtained for the award of <b>ONE</b> mark.
18	<p>Award <b>ONE</b> mark for a correct explanation of why the 95 <b>AND</b> 87 are <b>NOT</b> prime, e.g.</p> <ul style="list-style-type: none"> <li>87 is divisible by 3 and/or 29 <b>AND</b> 95 is divisible by 5 and/or 19</li> <li>87 is in the 3 times table <b>AND</b> 95 is in the 5 times table</li> <li>95 is divisible by five because every number in the five times table ends in five or zero. 87 is divisible by three because 9 is in the three times table so is ninety. Ninety minus three is 87</li> <li><math>8 + 7 = 15</math> and 15 is divisible by 3 <b>AND</b> 95 is divisible by 5</li> </ul>	1m	<p>No mark is awarded for circling '89' alone.</p> <p>Both non-primes must be explained correctly for the award of the mark.</p> <p><b>Do not</b> accept vague or incomplete explanations, e.g.</p> <ul style="list-style-type: none"> <li>The other 2 numbers have more than 2 factors (vague)</li> <li>87 is divisible by 3 (incomplete).</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>3 \times 27 = 87</math></li> <li>89 has three factors</li> <li>no numbers go into 89</li> </ul>

Qu.	Requirement	Mark	Additional guidance
19	<p>Award <b>TWO</b> marks for the correct answer of 3.75</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>60 \div 4 = 15</math> <math>250 \times 15 = 3750</math> <math>3750 \text{ ml} \div 1000 =</math></li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>• <math>250 \div 4 = 62.5 \text{ ml per second}</math> <math>62.5 \times 60 = 3750</math> <math>3750 \text{ ml} \div 1000 =</math></li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>• <math>60 \div 4 = 15</math>, so there are 15 lots of 4 seconds in 1 minute so there are 15 bottles per minute. There are 4 bottles in 1 litre <math>15 \div 4 =</math></li> </ul>	Up to 2m	<p>Accept for <b>TWO</b> marks, 3,750ml for final answer in working and the answer box blank <b>OR</b> 3,750 in the answer box where the litres has been replaced with millilitres.</p> <p>Accept for <b>ONE</b> mark 3,750 litres (l) in the answer box <b>OR</b> the final answer in working and answer box blank.</p> <p>Answer need not be obtained for the award of <b>ONE</b> mark.</p>
20	<p>Award <b>TWO</b> marks for two boxes ticked correctly, as shown:</p> <p style="text-align: center;"> <math>\frac{1}{20}</math>   <input type="checkbox"/>  <math>\frac{20}{40}</math>   <input type="checkbox"/>  <math>\frac{1}{5}</math>   <input checked="" type="checkbox"/>  <math>\frac{3}{15}</math>   <input checked="" type="checkbox"/>  <math>\frac{2}{100}</math>   <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> <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
21	<p>Rectangle divided, as shown:</p>  <p>OR</p>  <p>OR</p>  <p>OR</p> 	1m	Accept slight inaccuracies in drawing provided the intention is clear.

Qu.	Requirement	Mark	Additional guidance
22a	$\frac{2}{5}$	1m	Accept equivalent fractions and decimals e.g. $\frac{4}{10}$ and 0.4
22b	<p>Award <b>TWO</b> marks for the correct answer of 10.7</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>8.1 + 9.3 + 11.9 + 11.8 + 12.4 = 53.5</math> <math>53.5 \div 5</math></li> </ul>	Up to 2m	<p>Answer need not be obtained for the award of <b>ONE</b> mark.</p> <p>Any correct rounding or truncating does not negate an appropriate method.</p> <p>Any value which does not result from correct rounding or truncating implies an additional step not shown.</p>
23	<p>Award <b>TWO</b> marks for the correct answer of 720</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>3 \times 4 \times 6 = 72</math> <math>8 \times 9 \times 11 = 792</math> <math>792 - 72 =</math></li> </ul> <p>Award <b>ONE</b> mark for sight of 792</p>	Up to 2m	<p>Answer need not be obtained for the award of <b>ONE</b> mark.</p>