

---

**MATHEMATICS**

**1112/01**

Paper 1

**October 2018**

MARK SCHEME

Maximum Mark: 50

---

**Published**

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Markers were instructed to award marks. It does not indicate the details of the discussions that took place at an Markers' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the End of Series Report.

Cambridge will not enter into discussions about these mark schemes.

**Mark scheme annotations and abbreviations**

<b>M1</b>	method mark
<b>A1</b>	accuracy mark
<b>B1</b>	independent mark
<b>FT</b>	follow through after error
dep	dependent
oe	or equivalent
cao	correct answer only
isw	ignore subsequent working
soi	seen or implied

---

This document consists of **10** printed pages.

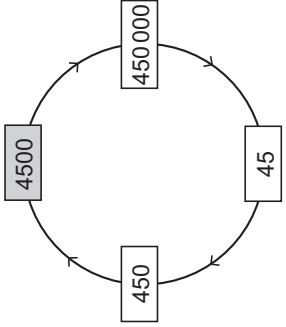
Question	Answer	Marks	Further Information									
1	7.57 cao	2										
	sight of 7. (...)	B1	Do not accept $7r4$ or $7\frac{4}{7}$ on its own.									
2	Less than 30	2	Award 2 marks for all correct.									
	Equal to 30											
	More than 30											
	<table border="0"> <tr> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> </table>			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>										
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>										
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>										
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>										
3	2 correct	B1										
4	8 -4 -2	2										
	2 correct	B1										
4	8:7	2										
	Any correct not fully simplified ratio provided the units are the same e.g. 160:140, 16:14, 1.6:1.4, 1:0.875, $1:\frac{7}{8}$ , $\frac{7}{8}:1$ , 1.14...:1 etc. <b>or</b> correct numbers reversed, i.e. 7:8	B1	Anything with units e.g. 8 cm : 7 cm scores maximum 1 mark.									

Question	Answer	Marks	Further Information
5	Rings <i>d</i> and ticks 'Angles on a straight line add up to 180°.	1	Allow any unambiguous indication of the correct answer.
6(a)	8.7 $\textcircled{9.1}$ 9.5    41.5	1	Allow any unambiguous indication of the correct answer.
6(b)	$\frac{1}{7}$ 0 $\textcircled{1}$ 7	1	Allow any unambiguous indication of the correct answer.
7(a)	13.8	1	
7(b)	4500	1	
8	( <i>y</i> =) 63	2	
	28 ÷ 4 × 3 × 3 oe or 21 seen	M1	e.g. 28 ÷ 4 × 3 ÷ $\frac{1}{3}$ , $\frac{252}{4}$ oe
9	900 (cm)	3	
	Correct method e.g. 20 × 2 + 50 × 2 + 70 × 2 + 130 × 2 + 180 × 2 or 20 × 2 + 70 × 2 + 50 × 4 + 130 × 4 or answer 9 m	M2	for correct method with only one numerical error or omission of one side
	130 or 180 seen or 1 extra correct length marked on the diagram in any unit.	M1	

Question	Answer	Marks	Further Information
<b>10(a)</b>	GH or HG	<b>1</b>	Allow any unambiguous indication of the correct answer.
<b>10(b)</b>	(x =) 70 Missing angle in first quadrilateral is $70^\circ$ or the letter x <b>or</b> $100 + 105 + 85 + x = 360$ or better e.g. $360 - (100 + 105 + 85)$ or $360 - 290$ <b>or</b> the missing angle value marked in the first quadrilateral is their x	M1	Allow on second diagram next to x May be seen on diagram.
<b>11</b>	1 (11) 12 (4) two numbers that add up to 13 <b>or</b> An integer value less than 11 in the 0–9 row <b>and</b> also an integer value of at least 12 in the 20 – 29 row	<b>2</b>  B1	Condone 0 in the 0–9 row

Question	Answer	Marks	Further Information																
12	<p><math>\frac{4}{5}</math> and an explanation that includes one of the following pairs</p> <ul style="list-style-type: none"> <li>• <math>\frac{1}{4}</math> and <math>\frac{1}{5}</math> or equivalent fractions</li> <li>• 0.2 and 0.25</li> <li>• 20% and 25%</li> </ul>	1	<p>Condone <math>\frac{4}{5}</math> and an explanation that includes one of the following pairs</p> <ul style="list-style-type: none"> <li>• 0.8 and 1.25</li> <li>• 80% and 125%</li> <li>• <math>\frac{25}{20}</math> and <math>\frac{16}{20}</math> or equivalent fractions with common denominator</li> </ul> <p>Accept finding <math>\frac{4}{5}</math> and <math>\frac{5}{4}</math> of a number and comparing.</p> <p>Do not accept 'fifths are smaller than quarters' alone.</p> <p>May use diagrams as part of the explanation.</p>																
13	<table style="width: 100%; text-align: center; border-collapse: collapse;"> <tr> <td style="border: 1px solid black; width: 25px; height: 25px;"><input checked="" type="checkbox"/></td> <td style="border: 1px solid black; width: 25px; height: 25px;"><input type="checkbox"/></td> <td style="border: 1px solid black; width: 25px; height: 25px;"><input type="checkbox"/></td> <td style="border: 1px solid black; width: 25px; height: 25px;"><input type="checkbox"/></td> </tr> <tr> <td style="border: 1px solid black; width: 25px; height: 25px;"><input checked="" type="checkbox"/></td> <td style="border: 1px solid black; width: 25px; height: 25px;"><input type="checkbox"/></td> <td style="border: 1px solid black; width: 25px; height: 25px;"><input checked="" type="checkbox"/></td> <td style="border: 1px solid black; width: 25px; height: 25px;"><input type="checkbox"/></td> </tr> <tr> <td style="border: 1px solid black; width: 25px; height: 25px;"><input type="checkbox"/></td> <td style="border: 1px solid black; width: 25px; height: 25px;"><input type="checkbox"/></td> <td style="border: 1px solid black; width: 25px; height: 25px;"><input checked="" type="checkbox"/></td> <td style="border: 1px solid black; width: 25px; height: 25px;"><input type="checkbox"/></td> </tr> <tr> <td style="border: 1px solid black; width: 25px; height: 25px;"><input checked="" type="checkbox"/></td> <td style="border: 1px solid black; width: 25px; height: 25px;"><input type="checkbox"/></td> <td style="border: 1px solid black; width: 25px; height: 25px;"><input type="checkbox"/></td> <td style="border: 1px solid black; width: 25px; height: 25px;"><input checked="" type="checkbox"/></td> </tr> </table>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	2	<p>Allow any unambiguous indication of the correct answer.</p>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>																
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>																
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>																
2 correct		B1																	

Question	Answer	Marks	Further Information																																																		
14	$\frac{8}{20}$ (oe) e.g. $\frac{2}{5}$ , $\frac{4}{10}$ , 0.4, 40%	3																																																			
	<p><b>either</b> a sample space diagram showing all 20 correct outcomes (totals or pairs)            e.g.</p> <table border="1"> <thead> <tr> <th></th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> <th>6</th> <th>7</th> <th>8</th> <th>9</th> <th>10</th> </tr> </thead> <tbody> <tr> <th>1</th> <td>1,2</td> <td>1,3</td> <td>1,4</td> <td>1,5</td> <td>1,6</td> <td>1,7</td> <td>1,8</td> <td>1,9</td> <td>1,10</td> </tr> <tr> <th>2</th> <td>2,2</td> <td>2,3</td> <td>2,4</td> <td>2,5</td> <td>2,6</td> <td>2,7</td> <td>2,8</td> <td>2,9</td> <td>2,10</td> </tr> <tr> <th>3</th> <td>3,2</td> <td>3,3</td> <td>3,4</td> <td>3,5</td> <td>3,6</td> <td>3,7</td> <td>3,8</td> <td>3,9</td> <td>3,10</td> </tr> <tr> <th>4</th> <td>4,2</td> <td>4,3</td> <td>4,4</td> <td>4,5</td> <td>4,6</td> <td>4,7</td> <td>4,8</td> <td>4,9</td> <td>4,10</td> </tr> </tbody> </table> <p><b>or</b>            for a list of all 20 correct outcomes (totals or pairs) and none incorrect/extra.</p>		2	3	4	5	6	7	8	9	10	1	1,2	1,3	1,4	1,5	1,6	1,7	1,8	1,9	1,10	2	2,2	2,3	2,4	2,5	2,6	2,7	2,8	2,9	2,10	3	3,2	3,3	3,4	3,5	3,6	3,7	3,8	3,9	3,10	4	4,2	4,3	4,4	4,5	4,6	4,7	4,8	4,9	4,10	M2	
	2	3	4	5	6	7	8	9	10																																												
1	1,2	1,3	1,4	1,5	1,6	1,7	1,8	1,9	1,10																																												
2	2,2	2,3	2,4	2,5	2,6	2,7	2,8	2,9	2,10																																												
3	3,2	3,3	3,4	3,5	3,6	3,7	3,8	3,9	3,10																																												
4	4,2	4,3	4,4	4,5	4,6	4,7	4,8	4,9	4,10																																												
	<p>finding at least 16 correct outcomes (totals or pairs)  <b>or</b>            identifying all 8 correct outcomes (totals or pairs) where the sum is 7 or more</p>	M1																																																			

Question	Answer	Marks	Further Information									
15	 <p>any box correct  <b>or</b>  follow through for <i>their</i> 45 being  <i>their</i> <math>450\,000 \div 10\,000</math></p>	2										
16	<table border="1"> <tbody> <tr> <td>x</td> <td>8</td> <td>0.2</td> </tr> <tr> <td>0.8</td> <td>6.4</td> <td>0.16</td> </tr> <tr> <td>0.3</td> <td>2.4</td> <td>0.06</td> </tr> </tbody> </table> <p><b>either</b> 0.8 correct with two of 0.16, 2.4 and 0.06 correct  <b>or</b>  0.8 wrong but all remaining entries correct allowing for follow through for 0.2 <i>x their</i> 0.8  <b>either</b> 0.8 correct  <b>or</b>  2.4 <b>and</b> 0.06 correct  <b>or</b>  0.8 wrong but 2 other entries correct allowing for the follow through of 0.2 <i>x their</i> 0.8</p>	x	8	0.2	0.8	6.4	0.16	0.3	2.4	0.06	3	Award 3 marks for all 4 correct.
x	8	0.2										
0.8	6.4	0.16										
0.3	2.4	0.06										
		B1										
		B2										
		B1	Only award if 3 or B2 are not already scored.									

Question	Answer	Marks	Further Information
<b>17(a)</b>	Primary <input checked="" type="checkbox"/> Secondary <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>	<b>1</b>	All three must be correct.
<b>17(b)</b>	A correct explanation e.g. There is no box for 0 / zero / none/ never / do not use <b>or</b> There is no box for 6 / it should say more than 5 times <b>or</b> it is not an exhaustive list	<b>1</b>	Do not allow e.g. <ul style="list-style-type: none"> <li>• they may not remember how many times</li> <li>• there are limited options</li> <li>• 2 or 3 should not be grouped</li> </ul>



Question	Answer	Marks	Further Information	
18	Median for normal toothbrush = 23 <b>and</b> Median for electric toothbrush = 16 <b>and</b> A suitable conclusion, following through from their averages, e.g. 'Patients who use an electric toothbrush have healthier teeth (than those who don't).'	3	Condone electric is better.	
	Correct value for normal toothbrush <b>Median</b> = 23 Accept <b>mean</b> 22.3			B1 B1 can only be scored if the number matches the word. Allow mean = 22
	Correct value for electric toothbrush <b>Median</b> = 16 Accept <b>mean</b> 17.7			B1 B1 can only be scored if the number matches the word. Allow mean = 18
19	A suitable conclusion following through from <i>their</i> averages. <b>or</b> A correct conclusion with no averages found i.e. that people who use an electric toothbrush have healthier teeth.	3	Note use <b>lowest</b> value for conclusion. Condone electric is better. Conclusion must be consistent with their numbers, if present, if blank conclusion must be correct.	
	408 (cm <sup>2</sup> )			M2 Implied by e.g. $90 + 120 + 150 + 24 + 24$ or better Condone one out of the five areas being incorrect or missing for M2.
	$6 \times 15 + 8 \times 15 + 10 \times 15 + \frac{1}{2} \times 6 \times 8 \times 2$ oe			B1 Two correct from 90, 120, 150, 24 and 24 <b>or</b> 360 <b>or</b> 48

Question	Answer	Marks	Further Information
<b>20</b>	112.5 (litres)	<b>2</b>	
	correct method, e.g. $7.5 \times 60 \times 0.25$ oe <b>or</b> 1 litre in 4 sec <b>and</b> 7.5 min = $450 \text{ sec} \text{ and } 450 \div 4$		M1
<b>21(a)</b>	2	<b>1</b>	Allow 'order 2'.
<b>21(b)</b>	0 <b>or</b> none <b>or</b> zero	<b>1</b>	
<b>22</b>	Rotation $90^\circ$ anticlockwise about (0, 0)	<b>3</b>	Combination of transformations can score maximum M1.
	Rotation		Do not allow e.g. turn
	$90^\circ$ anticlockwise oe		Allow equivalents, e.g. quarter turn anticlockwise or $+90^\circ$ or $270^\circ$ clockwise. Do not accept $90^\circ$ without the + sign.
	Centre (0, 0) (or the origin or O)		
<b>23</b>	Final image of triangle shown at co-ordinates (-5, 1) (-5, 3) (-2, 1)	M1	Award only if 0 scored. Condone vertices only for M mark.
	$-0.5$ or $-\frac{1}{2}$	<b>1</b>	Accept any equivalent fraction e.g. $-\frac{2}{4}$ Do not accept e.g. $-0.5x$