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**MATHEMATICS**

**1112/02**

Paper 2

**April 2017**

MARK SCHEME

Maximum Mark: 50

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**IMPORTANT NOTICE**

Mark Schemes have been issued on the basis of **one** copy per Assistant examiner and two copies per Team Leader.

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 Principal Examiner Report for Teachers.

Cambridge will not enter into discussions about these mark schemes.

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This document consists of **11** printed pages and **1** blank page.

**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

Question	Answer	Marks	Further Information
1	$\left(\frac{3}{4}\right)$ $\frac{7}{10}$ $\frac{5}{8}$ $\left(\frac{13}{20}\right)$ $\left(\frac{2}{3}\right)$ $\frac{6}{10}$	1	

Question	Answer	Marks	Further Information
2(a)	$4t - 20$	1	
2(b)	$(w =) 45$	1	

Question	Answer	Marks	Further Information
3(a)	150	1	
3(b)	90	1	

Question	Answer	Marks	Further Information
4	14 and 6	2	Allow them in reverse order for 2 marks.
	Recognition that joined width is counted twice, e.g.: <ul style="list-style-type: none"> <li>• <math>2 \times 40 = 68</math> oe</li> <li>• <math>2x + y = 34</math> (where x and y can be any letters)</li> <li>• <math>4x + 2y = 68</math></li> <li>• <math>\frac{68}{2} - \frac{40}{2}</math></li> </ul> <b>or</b> One of 14 or 6 given as either the length or the width.	M1	

Question	Answer	Marks	Further Information
5	69.6 (%) cao	2	
	$\frac{28.4}{40.8}$ implied by 0.69(6...) oe <b>or</b> for correct answer not given to 1dp. e.g. 69.61, 69.60, 69.608	M1	

Question	Answer	Marks	Further Information
6	No <b>and</b> a correct explanation e.g. <ul style="list-style-type: none"> <li>• If everyone pays \$35.14 the total amount paid would be 2 cents short or \$245.98</li> <li>• She should have rounded up to \$35.15</li> <li>• There won't be enough money.</li> <li>• They each need to pay a bit more.</li> </ul>	1	Do <b>not</b> accept "it would be easier if everyone just paid \$36" without reference to the \$35.14 not being enough to cover the bill.  Do <b>not</b> accept just a reference to a tip.

Question	Answer	Marks	Further Information
7	(\$)60	1	

Question	Answer	Marks	Further Information																
8(a)	<table><tr><td></td><td>Boys</td><td>Girls</td><td>Total</td></tr><tr><td>Play instrument</td><td>31</td><td>60</td><td>91</td></tr><tr><td>Do not play instrument</td><td>9</td><td>20</td><td>29</td></tr><tr><td>Total</td><td>40</td><td>80</td><td>120</td></tr></table>		Boys	Girls	Total	Play instrument	31	60	91	Do not play instrument	9	20	29	Total	40	80	120	2	
		Boys	Girls	Total															
Play instrument	31	60	91																
Do not play instrument	9	20	29																
Total	40	80	120																
	Three or more cells filled in correctly.	B1																	
8(b)	gives the percentages girls 75 (%) and boys 77.5 (%)  and  Ticks No	2	Follow through percentages from their table.  Follow through decision from their correctly calculated percentages.																
	One correct percentage seen	B1	Follow through percentage from their table.																

Question	Answer	Marks	Further Information
9	3.58... <b>and</b> 3.59...	1	

Question	Answer	Marks	Further Information
10	(\$)4.70 <b>and</b> supportive working that includes sight of either 1075 (grams) or 1.075 (kg) <b>or</b> 0.98 (kg) or 980 (grams) with no further incorrect working.	<b>2</b>	
	(\$)4.70 with no working <b>or</b> 1075 (grams) or 1.075 (kg) <b>or</b> Finding the correct cost for <i>their</i> mass.	B1	

Question	Answer	Marks	Further Information
11	(0).09 (oe)  $\frac{9}{100}$ , 9%	<b>2</b>	
	$1 - 0.3 - 0.15 - 0.28$ implied by 0.27 <b>or</b> $1 - 0.73$ <b>or</b> 0.09	M1	

Question	Answer	Marks	Further Information
12	11 : 5	<b>2</b>	Do not allow units in the ratio.
	5 : 11 <b>or</b> any ratio equivalent to 11 : 5, e.g. • 121 : 55 or 1.21 : 0.55 • 2.2 : 1 or 1 : 0.45...	B1	

Question	Answer	Marks	Further Information
13(a)	-14	1	
13(b)	(x =) 17	2	
	One correct trial $x > 10$	B1	
13(c)	$x^2 + x - 20$	2	
	A correct expansion with at least 3 terms correct from $x^2 + 5x - 4x - 20$	B1	

Question	Answer	Marks	Further Information
14	64 (km/h)	2	
	$240 \div 3.75$ (or equivalent)	M1	

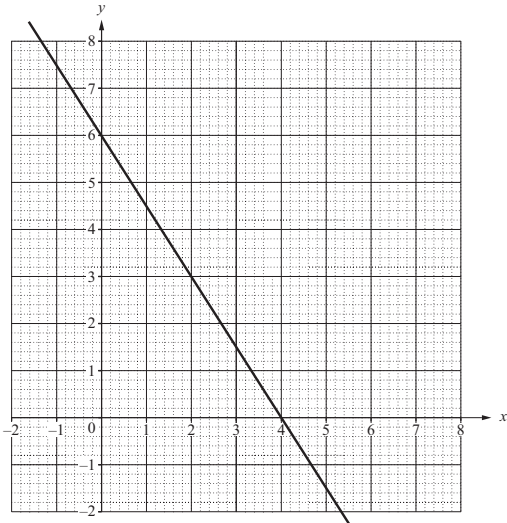
Question	Answer	Marks	Further Information
15(a)	A suitable comment about the accuracy, e.g. <ul style="list-style-type: none"> <li>• He has written too many digits.</li> <li>• He should have rounded his answer.</li> <li>• He shouldn't have written all the digits from his calculator.</li> <li>• The times are only given to one decimal place.</li> <li>• It's too accurate.</li> </ul>	1	Do not accept, e.g. <ul style="list-style-type: none"> <li>• Just 'it's not suitable'.</li> <li>• His answer should have been a whole number.</li> <li>• Just 'his answer is accurate'.</li> <li>• His answer is right (or wrong).</li> </ul>
15(b)	43.8 (seconds)	1	Condone 44, 43.84 or 43.843

Question	Answer	Marks	Further Information
16(a)	<p>Four points plotted correctly on the scatter graph.</p> <p>i.e.</p>	2	Do not allow with extra points.
	Two points correctly plotted.	B1	Ignore extra points.
16(b)	Negative (correlation)	1	Do <b>not</b> accept a description of the relationship.

Question	Answer	Marks	Further Information
17	5, 11, 21	1	All correct for 1 mark

Question	Answer	Marks	Further Information
18	$\frac{x(x-2)}{2}$ (cm <sup>2</sup> ) or equivalent	1	



Question	Answer	Marks	Further Information
19	71.6 (%)	2	Accept 72
	<ul style="list-style-type: none"> <li><math>\left( \frac{4.29 - 2.50}{2.50} \right)</math> or <math>\frac{1.79}{2.50}</math> or 0.716</li> <li><math>\frac{4.29}{2.50}</math> or 1.716 or 171.6(%)</li> </ul>	M1	
Question	Answer	Marks	Further Information
20(a)	4.5 or equivalent	2	
	Correctly substituting 1 in place of x, e.g. <ul style="list-style-type: none"> <li><math>3(1) + 2y = 12</math></li> <li><math>2y = 9</math></li> </ul>	M1	Substituting can be into <i>their</i> rearranged equation.
20(b)	(4, 0)	1	
20(c)	A line passing through (1, 4.5) and (4, 0) 	1	Follow through from answers to (a) and (b), provided there are different answers for each and the line passes through (1, <i>their a</i> ) and ( <i>their 4</i> , 0)

Question	Answer		Marks	Further Information								
21	<table><tr><th>Number of sides in polygon</th><th>Sum of the interior angles</th></tr><tr><td>5</td><td>540°</td></tr><tr><td>6</td><td>720°</td></tr><tr><td>9</td><td>1260(°)</td></tr></table>		Number of sides in polygon	Sum of the interior angles	5	540°	6	720°	9	1260(°)	2	
	Number of sides in polygon	Sum of the interior angles										
	5	540°										
	6	720°										
	9	1260(°)										
Either correct.		B1										

Question	Answer	Marks	Further Information
22	25 (km)	2	
	$24^2 + 7^2$ or better implied by 625	M1	

Question	Answer	Marks	Further Information
23	44.9(...) (m <sup>2</sup> )	3	Accept an answer that rounds to either 44.9 or 45.0
	Two of <ul style="list-style-type: none"> <li>• <math>\frac{\pi \times 2.5^2}{2}</math> or <math>\frac{25\pi}{8}</math> or 9.81 to 9.821...</li> <li>• <math>\frac{\pi \times 3^2}{2}</math> or <math>\frac{9\pi}{2}</math> or 14.1 to 14.14...</li> <li>• <math>6 \times 3.5</math> or 21</li> </ul> Implied by e.g. $7.625\pi(+21)$ or $\frac{61\pi}{8} (+21)$ or 23.9 to 23.96... or final answer of 45	M2	Allow figures rounded to 3 significant figures or better.
	$\pi \times k^2$ , where $k$ is 2.5 or 3 (could be implied by $6.25\pi$ or 19.6 to 19.64... or $9\pi$ or 28.26 to 28.3) <b>or</b> one of the calculations or values above.	M1	
Question	Answer	Marks	Further Information
24	An explanation indicating that there are gaps, e.g. <ul style="list-style-type: none"> <li>• There shouldn't be gaps</li> <li>• Mia has drawn a tessellation of a quadrilateral and a triangle</li> </ul>	1	

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