Cambridge Assessment International Education

Cambridge Lower Secondary Checkpoint

MATHEMATICS **1112/02**

Paper 2 **October 2021**

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 a Markers' meeting before marking began, which would have considered the acceptability of alternative answers.

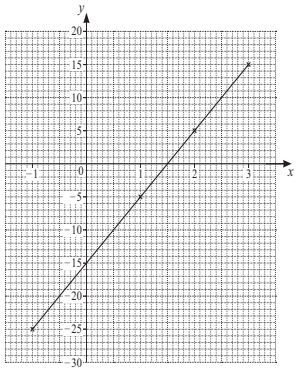
Mark schemes should be read in conjunction with the question paper and the End of Series Report. Cambridge will not enter into discussions about these mark schemes.

This document has **11** pages. Any blank pages are indicated.

Mark scheme annotations and abbreviations

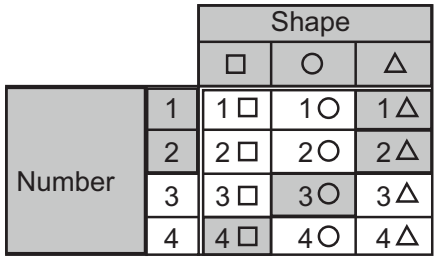
M1	method mark
A1	accuracy mark
B1	independent mark
FT	follow through after error
dep	dependent
oe	or equivalent
cao	correct answer only
isw	ignore subsequent working
soi	seen or implied

Question	Answer	Marks	Further Information
1	62.5 [%]	**1**	Accept $62\frac{1}{2}$ [%]
2	[◆ =] 40 **and** [✱ =] 5	**2**	
	At least 3 multiples of 8 less than 45 **or** 3 factors of 15 **or** for [◆ =] 5 **and** [✱ =] 40	M1	
3 (a)	12.5 [cm]	**1**	Accept $12\frac{1}{2}$ [cm]
(b)	125 [cm^2]	**1**	FT from *their* answer in part (**a**) × 10 correctly evaluated.
4	$7x$ + **3** + **2**x – 6	**2**	In correct order
	one correct answer	B1	
5	3 : 5	**1**	
6 (a)	17:07	**1**	Accept 5:07 [pm], accept space, dot etc. in place of the colon e.g 17 07, condone 17:07pm
(b)	52 [minutes]	**1**	
(c)	14:35	**1**	Accept 2:35 [pm], accept space, dot etc. in place of the colon e.g 1435, condone 14:35pm
7 (a)	–25, –5	**1**	In correct order.

Question	Answer	Marks	Further Information
(b)		**1**	Correct straight line joining (- 1, -25) to (3,15) Use template as a rough guide only, mark generously due to poor printing of graph ± 1 square tolerance.
8 (a)	28 [%]	**2**	
	For indication of a correct method. e.g. (16 000 – 12 500) ÷ 12 500 oe **or** 0.28 **or** (16 000 ÷ 12 500) × 100 oe **or** 128 [%]	M1	or better, e.g. $\frac{3500}{12500}$ [× 100] or better, e.g. 1.28 × 100 [– 100]
(b)	($) 15 200	**2**	
	For sight of 0.95 or 95% or $\frac{95}{100}$ **or** $\frac{5}{100}$ × 16 000 oe **or** 800 **or** answer 11875	M1	This is 95% reduction on $12500
9 (a)	(2, 1)	**1**	

Question	Answer	Marks	Further Information
(b)	[D=] (5, –1)	**1**	
10	$\frac{5a}{7}$ **and** $\frac{3}{2c}$	**2**	Accept $\frac{5}{7}a$ Do **not** accept $\frac{3}{2}c$ or 1.5c Take care as common incorrect answer is $\frac{2}{3c}$
	1 correct answer	B1	
11	6	**2**	
	A correct conversion between kg and tonnes, e.g. • 17 000 [kg] • 0.12 [tonnes] • 102 [tonnes] **or** correct method $\frac{850 \times 120}{1000} \div 17$ oe **or** digit 6 in final answer	M1	Stating 1 tonne = 1000 kg is not enough oe e.g. $\frac{102000}{17} \div 1000$, $6000 \div 1000$ e.g. 0.006, 6000
12	180 [cm]	**1**	Accept 1.8 m as long as unit is given.
13	Ticks 'No' with 210[cm] **and** 200[cm]	**2**	Accept: • Ticks 'No' with 200 [cm] **and** –10 [cm] oe,

Question	Answer	Marks	Further Information
	or Ticks 'No' with 2.1[m]		oe e.g. 10 [cm] short (repeated subtraction method) • Ticks 'No' with 210 [cm] **and** 10 [cm] more needed (200 implied)
	2 × 45 + 2 × 60 oe	M1	Implied by 210[cm] or 2.1[m] or –10[cm] oe for M1 e.g. • 200 – 45 – 60 – 45 – 60 • 2 × 0.45 + 2 × 0.6
14	34	**2**	
	$\frac{115}{360} \times 144$ oe **or** 46 **or** $\frac{60}{360} \times 480$ oe **or** 80	M1	oe e.g. $115 \div \left(\frac{360}{144}\right)$, 115 ÷ 2.5, $115 \times \left(\frac{144}{360}\right)$, 115 × 0.4 144 ÷ (360 ÷ 115) oe e.g. $60 \div \left(\frac{360}{480}\right)$, 60 ÷ 0.75, $60 \times \left(\frac{480}{360}\right)$, 60 × 1.33 480 ÷ (360 ÷ 60)
15 (a)	$\frac{x+3}{7}$ **and** Add 2 [to x] then multiply by 9 **or** Multiply [x] by 9 then add 18	**2**	Accept any equivalent algebraic expression e.g. (x + 3) ÷ 7 Do **not** accept e.g. x + 3 ÷ 7 Accept + 2 then × 9 **or** × 9 then +18 Accept multiply x and 2 by 9 then add [them]

Question	Answer	Marks	Further Information
	1 box correct	B1	
(b)	$(x - 6)^2$	**1**	Accept any equivalent algebraic expression e.g. $(x - 6)(x - 6)$, $x^2 - 12x + 36$ Do **not** accept without brackets e.g. $x - 6^2$ Do **not** isw incorrect expanding following a correct answer.
16 (a)		**1**	Must be number first then shape.
(b)	$\frac{1}{6}$	**1**	Accept equivalent fractions, decimals and percentages, 16.7%, 0.167. Do **not** accept truncation at 2sf i.e. 16%, 0.16 Do **not** accept ratio answers 1 : 6 or words 1 in 6
17	First box: inserts a number between 0 and 1 **exclusive** **and** Second box: inserts a number greater than 1 **and**	**2**	Accept fractions, decimals or powers of 10. e.g. 0.1, $\frac{1}{10}$, 10^{-1}

Question	Answer	Marks	Further Information
	Third box: inserts a number between 0 and 0.1 **exclusive**		e.g. 0.01, $\frac{1}{100}$, 10^{-2}
	2 boxes correctly filled	B1	
18	9	**1**	
19	$x = 2y + 4$ $x = (y - 4) \div 2$ $x = (y \div 2) - 4$ $x = (y + 4) \div 2$	**1**	Accept any unambiguous indication
20	Hexagon	**1**	
21	A complete trial and improvement method leading to the answer x = 2.3 Must include all three marking points below.	**3**	Ignore the final column in the table when marking.

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th><th>Further Information</th></tr>
<tr><td></td><td>Any correct trial of a number x, where $2 < x \leqslant 3$</td><td>M1</td><td>
<table>
<tr><th>x</th><th>$x^3 + 3x$
Accept rounded or truncated answers provided they allow for comparison</th></tr>
<tr><td>2.1</td><td>15.5[61]</td></tr>
<tr><td>2.2</td><td>17.2[48]</td></tr>
<tr><td>2.25</td><td>18.1[40625]</td></tr>
<tr><td>2.3</td><td>19.0[67]</td></tr>
<tr><td>2.31</td><td>19.2[56391]</td></tr>
<tr><td>2.32</td><td>19.4[47168]</td></tr>
<tr><td>2.33</td><td>19.6[39337]</td></tr>
<tr><td>2.34</td><td>19.8[32904]</td></tr>
<tr><td>2.35</td><td>20.0[27875]</td></tr>
<tr><td>2.4</td><td>21.0[24]</td></tr>
<tr><td>2.5</td><td>23.1[25]</td></tr>
<tr><td>2.6</td><td>25.3[76]</td></tr>
<tr><td>2.7</td><td>27.7[83]</td></tr>
<tr><td>2.8</td><td>30.3[52]</td></tr>
<tr><td>2.9</td><td>33.0[89]</td></tr>
<tr><td>3</td><td>36</td></tr>
</table>
</td></tr>
<tr><td></td><td>a different correct trial of $x = 2.35$</td><td>M1</td><td>Accept values between $2.3485\ldots \leqslant x \leqslant 2.35$</td></tr>
<tr><td></td><td>2.3 in answer space</td><td>B1</td><td></td></tr>
<tr><td>22 (a)</td><td>Any of the following, or equivalent:

• You do not know which height corresponds to which hand span/the data is not paired</td><td>1</td><td>Do not accept
You cannot draw a scatter diagram (without further explanation).</td></tr>
</table>

Question	Answer	Marks	Further Information
	• The original data has been lost /we don't know the numbers • The class data has been grouped		See additional guidance for exemplars.
(b)	A usable data collection sheet that allows you to see which height corresponds to which hand span e.g. Height | Hand span | | | | | | | | | |	**1**	Accept if data included. Do not accept diagrams e.g. stem-and-leaf (as data is still not paired).
23 (a)	54 [*l*]	**2**	
	Correct method $\frac{60 \times 30 \times 30}{1000}$ **or** Digits 54 in final answer	M1	 e.g. 54000, 0.054 etc.
(b)	26.5 [cm]	**1**	Do **not** allow answer in metres e.g. 0.265 m Accept FT for $\frac{47.7}{their\ (a)} \times 30$ or $\frac{1431}{their\ (a)}$ correctly evaluated (and correctly rounded, if necessary, to 2sf or better or truncated to 3sf)
24	A correct reason e.g. the three probabilities add up to less than 1 or 100% **or**	**1**	Accept e.g. • the probabilities don't add to 100 (BOD missing percent sign) • because it is not 1 (BOD the "it")

Question	Answer	Marks	Further Information
	the three probabilities do not add up 1 or 100%		• there must be one more colour with probability of 0.2 (even though there could be more than one extra colour) • it is only 0.8 (even though "it" is vague, the word "only" implies total probability is too low) Do **not** accept e.g. • the probabilities add up to 0.8 (no mention of this being less than 1/not equal to 1)
25	18.7 [cm]	**3**	Accept 18.6[9693…] accept truncated or rounded to 3sf or better or the exact answers $4 + \sqrt{216}$, $4 + 6\sqrt{6}$ Accept 19 only with correct working e.g. $\sqrt{15^2 - 3^2}$ or better or 14.7 (or better)
	$\sqrt{15^2 - 3^2}$ **or** 14.7 **or** $\sqrt{5^2 - 3^2}$ **or** 4	M2	or better e.g. $\sqrt{216}$ or better e.g. $\sqrt{16}$ For 14.7 accept 14.6[9693…] truncated or rounded to at least 3 figs
	$MD^2 + 3^2 = 15^2$ oe or better **or** $MB^2 + 3^2 = 5^2$ oe or better	M1	or better, e.g. $MD^2 = 216$ where *M* is the midpoint of *AC,* other letters are possible or better e.g. $MB^2 = 16$