

Cambridge Lower Secondary Checkpoint

MATHEMATICS

1112/02

Paper 2

April 2022

MARK SCHEME

Maximum Mark: 50

Published

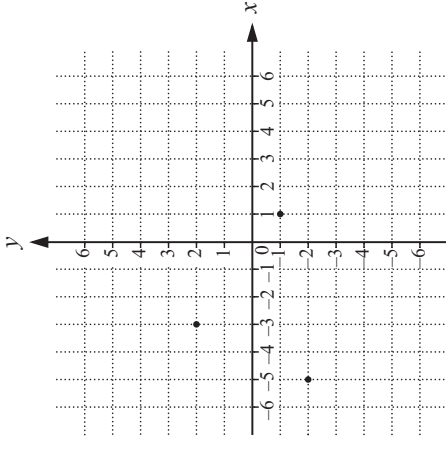
This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Markers were instructed to award marks. It does not indicate the details of the discussions that took place at a Markers' meeting before marking began, which 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 **12** pages.

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

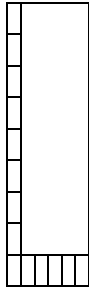
Question	Answer	Marks	Further Information
1	7	1	Accept 7 circled or ticked in the list.
2	10, 12 and 14 in any order	1	
3(a)	(\$)128.25	1	Do not accept incorrect rounding or truncation, e.g. 128.20, 128.30
3(b)	30(%)	2	
	$\frac{6.5 - 5}{5}$ or $\frac{1.5}{5}$ or $\frac{6.5}{5} - 1$ or $\frac{6.5}{5} \times 100$	M1	Implied by 0.3 Implied by 130(%) Do not accept 1.3
4(a)	Plots three points correctly. 	1	Ignore labelling of points. Ignore extra points. Points may be implied by the vertices of shapes or ends of lines. A letter alone is insufficient to indicate the position of the point.
4(b)	(3, 3) or (-1, -5) or (-9, 1)	1	FT from <i>their</i> answers in (a), provided at least two correct points (could include a square, a rectangle or a rhombus).

Question	Answer	Marks	Further Information
5	68 (km/h)	1	
6(a)	1.5 (metres per second)	2	Accept simplified equivalent fractions $1\frac{1}{2}$ or $\frac{3}{2}$
6(b)	90 (seconds)	1	
7	(\$)7.25	2	
	11.6 ÷ 8 or 1.45 or $\frac{5}{8} \times 11.6$ oe	M1	oe, e.g. $58 \div 8$, $11.6 \div 1.6$
8	6 and 0	1	In correct order. Accept in words, e.g. 'no' for 0
9	13:32 or 1:32 [pm]	2	Accept space, dash, dot, etc. in place of the colon e.g 13 32 Do not accept 1:32 am, 01:32 or 13h32 (m) for 2 marks.
	For seeing any of these relevant time intervals: 39 [mins] 2 hours 25 minutes or 145 [mins] 1 hour 11 minutes oe or 71 [mins] or for seeing 13:48 or 1:48 [pm]	B1	B1 implied by 1:32 am, 01:32 or 13h32 (m) Do not accept 01 48 or 1:48 am

Question	Answer	Marks	Further Information						
10	<table border="1"> <tr> <td>Has at least one right angle</td> <td>Has no right angles</td> </tr> <tr> <td>A</td> <td>D</td> </tr> <tr> <td>B</td> <td>C</td> </tr> </table> <p>Has parallel sides</p> <p>Has no parallel sides</p>	Has at least one right angle	Has no right angles	A	D	B	C	1	Accept any clear indication of their choice.
Has at least one right angle	Has no right angles								
A	D								
B	C								
11	3.17(...) or 3.2	1							
12(a)	$\frac{5}{x}$ final answer	1							
12(b)	$\frac{2y+m}{2x}$ final answer	2							
	<p>For a correct unsimplified single algebraic fraction, e.g. $\frac{2xy + xm}{2x^2}$</p> <p>or</p> <p>two correct fractions with a common denominator, e.g. $\frac{2y}{2x} + \frac{m}{2x}$</p>	M1	<p>$\frac{y+m}{x}$ or $\frac{y+m}{2x}$</p> <p>Award M1 for correct answer seen then spoilt, e.g. $\frac{2y+m}{2x} = \frac{y+m}{x}$</p>						

Question	Answer	Marks	Further Information															
13(a)	<table border="1"> <thead> <tr> <th></th> <th>Class A</th> <th>Class B</th> </tr> </thead> <tbody> <tr> <td>Mean</td> <td>6.44</td> <td>4.04</td> </tr> <tr> <td>Mode</td> <td>4</td> <td>6</td> </tr> <tr> <td>Median</td> <td>6</td> <td>4</td> </tr> <tr> <td>Range</td> <td>6</td> <td>5</td> </tr> </tbody> </table>		Class A	Class B	Mean	6.44	4.04	Mode	4	6	Median	6	4	Range	6	5	2	
	Class A	Class B																
Mean	6.44	4.04																
Mode	4	6																
Median	6	4																
Range	6	5																
	Any 1 correct.	B1																
13(b)	<table border="0"> <tr> <td style="text-align: center;">Mean</td> <td style="text-align: center;">Mode</td> <td style="text-align: center;">Median</td> <td style="text-align: center;">Range</td> </tr> </table>	Mean	Mode	Median	Range	1	Accept any clear indication.											
Mean	Mode	Median	Range															
13(c)	<p>Ticks A and explains that the mean of A's results is higher than B's</p> <p>or</p> <p>Strict FT:</p> <ul style="list-style-type: none"> Ticks A and explains that the median of A's results is higher than B's provided their median is greater than 4 Ticks B and explains that the median of B's results is higher than A's provided their median is less than 4 	1	<p>Do not accept "average" alone, they need to state which average or imply it, e.g. with correct figures.</p> <p>Ignore correct statements, comparisons or interpretations of the mode and range if with a correct comparison of the mean or median, e.g.</p> <ul style="list-style-type: none"> The mean and range are both bigger in A The mean and mode are higher for class A (with a mode greater than 6 in (a)). <p>An incorrect statement, comparison or interpretation invalidates the mark, e.g.</p> <ul style="list-style-type: none"> All the averages/values are bigger (with a mode smaller than 6 in (a)). 															

Question	Answer	Marks	Further Information																														
14	<p>A complete trial and improvement method leading to the answer ($x =$) 6.2</p> <p>Must include all three marking points below.</p>	3	<p>Ignore the final column in the table when marking.</p> <table border="1" data-bbox="312 147 876 965"> <thead> <tr> <th data-bbox="312 147 381 439">x</th> <th data-bbox="312 439 381 965">$x^2 + 4x$ (Accept rounded or truncated values to at least 2sf)</th> </tr> </thead> <tbody> <tr><td data-bbox="381 147 416 439">6.1</td><td data-bbox="381 439 416 965">61(.61)</td></tr> <tr><td data-bbox="416 147 451 439">6.15</td><td data-bbox="416 439 451 965">62(.4225)</td></tr> <tr><td data-bbox="451 147 486 439">6.16</td><td data-bbox="451 439 486 965">62(.5856)</td></tr> <tr><td data-bbox="486 147 521 439">6.17</td><td data-bbox="486 439 521 965">62(.7489)</td></tr> <tr><td data-bbox="521 147 557 439">6.18</td><td data-bbox="521 439 557 965">62(.9124)</td></tr> <tr><td data-bbox="557 147 592 439">6.19</td><td data-bbox="557 439 592 965">63(.0761)</td></tr> <tr><td data-bbox="592 147 627 439">6.2</td><td data-bbox="592 439 627 965">63(.24)</td></tr> <tr><td data-bbox="627 147 662 439">6.3</td><td data-bbox="627 439 662 965">64(.89)</td></tr> <tr><td data-bbox="662 147 697 439">6.4</td><td data-bbox="662 439 697 965">66(.56)</td></tr> <tr><td data-bbox="697 147 732 439">6.5</td><td data-bbox="697 439 732 965">68(.25)</td></tr> <tr><td data-bbox="732 147 767 439">6.6</td><td data-bbox="732 439 767 965">69(.96)</td></tr> <tr><td data-bbox="767 147 802 439">6.7</td><td data-bbox="767 439 802 965">71(.69)</td></tr> <tr><td data-bbox="802 147 837 439">6.8</td><td data-bbox="802 439 837 965">73(.44)</td></tr> <tr><td data-bbox="837 147 873 439">6.9</td><td data-bbox="837 439 873 965">75(.21)</td></tr> </tbody> </table>	x	$x^2 + 4x$ (Accept rounded or truncated values to at least 2sf)	6.1	61(.61)	6.15	62(.4225)	6.16	62(.5856)	6.17	62(.7489)	6.18	62(.9124)	6.19	63(.0761)	6.2	63(.24)	6.3	64(.89)	6.4	66(.56)	6.5	68(.25)	6.6	69(.96)	6.7	71(.69)	6.8	73(.44)	6.9	75(.21)
x	$x^2 + 4x$ (Accept rounded or truncated values to at least 2sf)																																
6.1	61(.61)																																
6.15	62(.4225)																																
6.16	62(.5856)																																
6.17	62(.7489)																																
6.18	62(.9124)																																
6.19	63(.0761)																																
6.2	63(.24)																																
6.3	64(.89)																																
6.4	66(.56)																																
6.5	68(.25)																																
6.6	69(.96)																																
6.7	71(.69)																																
6.8	73(.44)																																
6.9	75(.21)																																
	Any correct trial of a number between 6 and 7	M1	For both M1 marks to be awarded, one appropriate trial to at least 1 decimal place and one appropriate trial to at least 2 decimal places must be seen, e.g. trial at 6.2 and trial at 6.15																														
	A correct trial of x where $6.15 \leq x < 6.2$	M1																															
	6.2 in answer space.	B1																															

Question	Answer	Marks	Further Information
15	60	3	
	9 and 6 or 6 and 10 or 54 seen	M2	Accept e.g. <ul style="list-style-type: none"> the calculations 9×6 or 6×10 a sketch → 
	For correct unit conversion: <ul style="list-style-type: none"> 120 (cm) or 80 (cm) or 0.13 (m) or 0.115 (m) seen Implied by 9600 or 0.01495 or 64(.2....) seen or for a correct method with a consistent unit conversion error	M1	If M2 not scored. E.g. $1200 \div 13$ truncated to an integer and $800 \div 11.5$ truncated to an integer. Note dividing two areas is not a correct method.

Question	Answer	Marks	Further Information												
16	<p>Metal B ticked and correct supporting comparable figures, e.g.</p> <ul style="list-style-type: none"> • 0.07 [: 1] and 0.09 [: 1] • 0.07 and 0.08 • [1 :] 13[:.5] and [1 :] 11[:.2] • 112 [: 1512] and 135 [: 1512] • $\frac{112}{122}$ and $\frac{135}{145}$ • $\frac{1512}{1769}$ and $\frac{1512}{1769}$ • [Metal A would be] 5 : 67[:.5] or 4[:.148...] : 56 • [Metal B would be] 2 : 22[:.4] or 2[:.410...] : 27 	2	<p>(Using $\frac{2}{27}$ and $\frac{5}{56}$:)</p> <ul style="list-style-type: none"> • Any rounding or truncation: 0.07[407 ...] and 0.08[928 ...] • Any rounding or truncation: 0.92[592...] and 0.91[071...] <p>(Using $\frac{2}{29}$ and $\frac{5}{61}$:)</p> <ul style="list-style-type: none"> • Any rounding or truncation: 0.06[896...] and 0.08[196...] • Any rounding or truncation: 0.93[103...] and 0.91[803...] <p>Many other values are possible, e.g.</p> <table border="1" data-bbox="608 248 981 965"> <tr> <td>[10 :] 135 and [10 :] 112</td> <td></td> </tr> <tr> <td>7(%) and 9(%)</td> <td>93(%) and 91(%)</td> </tr> <tr> <td>7(%) and 8(%)</td> <td>93(%) and 92(%)</td> </tr> <tr> <td>$\frac{1400}{1512}$ and $\frac{1377}{1512}$</td> <td>$\frac{1647}{1769}$ and $\frac{1624}{1769}$</td> </tr> <tr> <td>$13\frac{1}{2}$ and $11\frac{1}{5}$</td> <td>14 and 11</td> </tr> <tr> <td>2.1... and 2.5 (from 61 ÷ 29 and 5 ÷ 2)</td> <td>2[:.07 ...] ... and 2.5 (from 56 ÷ 27 and 5 ÷ 2)</td> </tr> </table>	[10 :] 135 and [10 :] 112		7(%) and 9(%)	93(%) and 91(%)	7(%) and 8(%)	93(%) and 92(%)	$\frac{1400}{1512}$ and $\frac{1377}{1512}$	$\frac{1647}{1769}$ and $\frac{1624}{1769}$	$13\frac{1}{2}$ and $11\frac{1}{5}$	14 and 11	2.1... and 2.5 (from 61 ÷ 29 and 5 ÷ 2)	2[:.07 ...] ... and 2.5 (from 56 ÷ 27 and 5 ÷ 2)
[10 :] 135 and [10 :] 112															
7(%) and 9(%)	93(%) and 91(%)														
7(%) and 8(%)	93(%) and 92(%)														
$\frac{1400}{1512}$ and $\frac{1377}{1512}$	$\frac{1647}{1769}$ and $\frac{1624}{1769}$														
$13\frac{1}{2}$ and $11\frac{1}{5}$	14 and 11														
2.1... and 2.5 (from 61 ÷ 29 and 5 ÷ 2)	2[:.07 ...] ... and 2.5 (from 56 ÷ 27 and 5 ÷ 2)														
	One of the converted values seen.	B1													

Question	Answer	Marks	Further Information
17	40 and 11 – 15 One correct answer.	2 B1	In correct order.
18	First gap must contain a decimal x where $0.009 < x < 0.01$ (e.g. 0.0095 or 0.00924). and Second gap must contain a decimal y where $0.01 < y < 0.011$ (e.g. 0.0105 or 0.01087). One correct answer.	2 B1	Do not accept, e.g. 0.0090 Do not accept, e.g. 0.010
19	Rotation, 90° anticlockwise oe about (1, 1). Rotation 90° anticlockwise oe (1, 1)	3 B1 B1 B1	Combinations of transformations score 0 e.g. rotation, left 3 (squares). Do not accept turned. oe, e.g. 270 clockwise, -270 , $+90$, 90 counter clockwise but not 90° alone Do not accept $\begin{pmatrix} 1 \\ 1 \end{pmatrix}$

Question	Answer	Marks	Further Information																																																																																										
20	(1, 5)	1																																																																																											
21	36 (cm ²)	1																																																																																											
22	$1\frac{1}{5}$	1	Accept equivalent mixed numbers, e.g. $1\frac{2}{10}$ Do not accept $\frac{6}{5}$ or 1.2																																																																																										
23	$\frac{11}{16}$ or 0.6875 or 68.75%	2	Accept 0.69 or 69% or better. Do not accept ratio or in words, e.g. 11:16, 11 in 16																																																																																										
	Either for a sample space diagram (or a list) showing the 16 possible outcomes or totals (allow no more than one of the 16 outcomes to be incorrect) or for identifying the outcomes that give a score of more than 3 (1, 3) (2, 2) (2, 3) (3, 1) (3, 1) (3, 2) (3, 3) (3, 1) (3, 1) (3, 2) (3, 3) (allow one omission or one repeat) or for identifying the five outcomes that give a score of 3 or less. (1, 1) (1, 1) (1, 2) (2, 1) (2, 1)	M1	e.g. <table border="1" style="display: inline-table; margin-right: 20px;"> <tr><td></td><td>1</td><td>1</td><td>2</td><td>3</td></tr> <tr><td>1</td><td>2</td><td>2</td><td>3</td><td>4</td></tr> <tr><td>2</td><td>3</td><td>3</td><td>4</td><td>5</td></tr> <tr><td>3</td><td>4</td><td>4</td><td>5</td><td>6</td></tr> <tr><td>3</td><td>4</td><td>4</td><td>5</td><td>6</td></tr> </table> or <table border="1" style="display: inline-table; margin-right: 20px;"> <tr><td></td><td>1</td><td>2</td><td>3</td></tr> <tr><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr><td>2</td><td>3</td><td>4</td><td>5</td></tr> <tr><td>3</td><td>4</td><td>5</td><td>6</td></tr> </table> <table border="1" style="display: inline-table; margin-right: 20px;"> <tr><td></td><td>1</td><td>2</td><td>3</td></tr> <tr><td>1</td><td></td><td></td><td>✓</td></tr> <tr><td>1</td><td></td><td></td><td>✓</td></tr> <tr><td>2</td><td></td><td>✓</td><td>✓</td></tr> <tr><td>3</td><td>✓</td><td>✓</td><td>✓</td></tr> </table> or <table border="1" style="display: inline-table; margin-right: 20px;"> <tr><td></td><td>1</td><td>2</td><td>3</td><td>3</td></tr> <tr><td>1</td><td></td><td></td><td>✓</td><td>✓</td></tr> <tr><td>1</td><td></td><td></td><td>✓</td><td>✓</td></tr> <tr><td>2</td><td></td><td>✓</td><td>✓</td><td>✓</td></tr> <tr><td>3</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr> </table> 1 + 1 = 2 1 + 1 = 2 1 + 2 = 3 2 + 1 = 3 2 + 1 = 3 Accept in any order.		1	1	2	3	1	2	2	3	4	2	3	3	4	5	3	4	4	5	6	3	4	4	5	6		1	2	3	1	2	3	4	1	2	3	4	2	3	4	5	3	4	5	6		1	2	3	1			✓	1			✓	2		✓	✓	3	✓	✓	✓		1	2	3	3	1			✓	✓	1			✓	✓	2		✓	✓	✓	3	✓	✓	✓	✓
	1	1	2	3																																																																																									
1	2	2	3	4																																																																																									
2	3	3	4	5																																																																																									
3	4	4	5	6																																																																																									
3	4	4	5	6																																																																																									
	1	2	3																																																																																										
1	2	3	4																																																																																										
1	2	3	4																																																																																										
2	3	4	5																																																																																										
3	4	5	6																																																																																										
	1	2	3																																																																																										
1			✓																																																																																										
1			✓																																																																																										
2		✓	✓																																																																																										
3	✓	✓	✓																																																																																										
	1	2	3	3																																																																																									
1			✓	✓																																																																																									
1			✓	✓																																																																																									
2		✓	✓	✓																																																																																									
3	✓	✓	✓	✓																																																																																									

Question	Answer	Marks	Further Information												
24(a)	(c =) 1.75x	2	Accept equivalent values for 1.75 e.g. $\frac{7}{4}$, $\frac{17.5}{10}$ or $1\frac{3}{4}$ Accept (c =) $x \times 1.75$												
24(b)	Rise over run attempted, e.g. $12.5 \div 7, \frac{5}{3}$ (\$) 40.95 or FT <i>their</i> (a) with 23.4 for x, correctly evaluated or their rise over run $\times 23.4$ correctly evaluated.	M1	Implied by a value k in the range $1.6 \leq k \leq 1.8$ Award M1 if incorrect variable used, e.g. $c = 1.75m$												
25	C A B	1	For the FT: Accept any formula, e.g. (c =) $kx + b$, $\frac{x}{k} + b$ with $k \neq 0$, k can be 1 If rounded, must be correct to at least the nearest cent or to 3sf.												
25	For any one of these values seen: <table border="1" data-bbox="1008 1144 1310 1910" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>A</th> <th>B</th> <th>C</th> </tr> </thead> <tbody> <tr> <td>5*</td> <td></td> <td>4.56... rounded or truncated to at least 1dp</td> </tr> <tr> <td>150</td> <td>93750</td> <td></td> </tr> <tr> <td>Volume</td> <td>1953125</td> <td>95</td> </tr> </tbody> </table>	A	B	C	5*		4.56... rounded or truncated to at least 1dp	150	93750		Volume	1953125	95	2	Accept for 2 marks answer: 125 cm^2 , 125 cm^3 , 125 cm Accept sight of all of these numbers alone even if not associated with a particular cube or with SL, SA or V: 4.5(6...), 4.6, 150, 93750, 1953125, 95 Accept 93750 or 1953125 rounded or truncated e.g. 93000, 2000000 *For the number 5 it needs to be associated with something, not just sight of 5 alone, e.g. <ul style="list-style-type: none"> • Side length = 5 • (Cube) $A = 5$ • 5 cm • $\sqrt[3]{125} = 5$ • Writing 5 next to 125 cm3
A	B	C													
5*		4.56... rounded or truncated to at least 1dp													
150	93750														
Volume	1953125	95													