Cambridge Assessment International Education

# Cambridge Lower Secondary Checkpoint

**MATHEMATICS** **1112/02**

Paper 2 **April 2022**

MARK SCHEME

Maximum Mark: 50

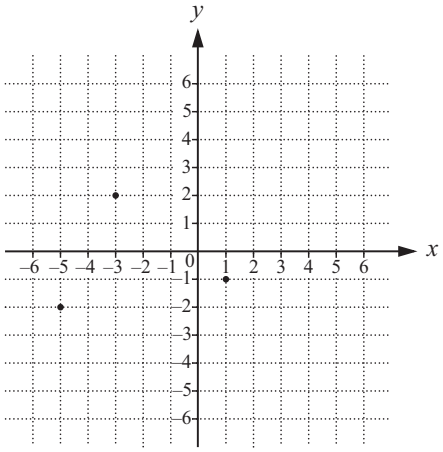
Published

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.

## 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 |

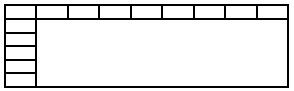
| Question | Answer | Marks | Further Information |
|---|---|---|---|
| 1 | 7 | **1** | Accept 7 circled or ticked in the list. |
| 2 | 10, 12 **and** 14 in any order | **1** | |
| 3(a) | ($)128.25 | **1** | Do **not** accept incorrect rounding or truncation, e.g.128.20, 128.30 |
| 3(b) | 30(%) | **2** | |
| | $\frac{6.5-5}{5}$ **or** $\frac{1.5}{5}$ **or** $\frac{6.5}{5}-1$ **or** $\frac{6.5}{5}\times 100$ | M1 | Implied by 0.3<br><br>Implied by 130(%)<br>Do **not** accept 1.3 |
| 4(a) | Plots three points correctly.<br>  | **1** | Ignore labelling of points.<br>Ignore extra points.<br>Points may be implied by the vertices of shapes or ends of lines.<br>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 *their* 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 $\frac{3}{2}$ |
| | 450 ÷ 5 **or** 90<br>**or** 450 ÷ 300 oe | M1 | |
| 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 ÷ 8, 11.6 ÷ 1.6 |
| 8 | 6<br>**and**<br>0 | **1** | In correct order.<br>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<br>e.g 13 32<br>Do **not** accept 1:32 am, 01:32 or 13h32 (m) for 2 marks. |
| | For seeing any of these relevant time intervals:<br>39 [mins]<br>2 hours 25 minutes or 145 [mins]<br>1 hour 11 minutes oe or 71 [mins]<br><br>**or** for seeing 13:48 or 1:48 [pm] | B1 | B1 implied by 1:32 am, 01:32 or 13h32 (m)<br><br>Do **not** accept 01 48 or 1:48 am |

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

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th><th>Further Information</th></tr>
<tr><td rowspan="2">13(a)</td><td><table><tr><td></td><td>Class A</td><td>Class B</td></tr><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></table></td><td>2</td><td></td></tr>
<tr><td>Any 1 correct.</td><td>B1</td><td></td></tr>
<tr><td>13(b)</td><td>(Mean) Mode (Median) Range</td><td>1</td><td>Accept any clear indication.</td></tr>
<tr><td>13(c)</td><td>Ticks A and explains that the mean of A’s results is higher than B’s<br><br>or<br><br>Strict FT:<br>• Ticks A and explains that the median of A’s results is higher than B’s provided their median is greater than 4<br>• Ticks B and explains that the median of B’s results is higher than A’s provided their median is less than 4</td><td>1</td><td>Do not accept “average” alone, they need to state which average or imply it, e.g. with correct figures.<br><br>Ignore correct statements, comparisons or interpretations of the mode and range if with a correct comparison of the mean or median, e.g.<br>• The mean and range are both bigger in A<br>• The mean and mode are higher for class A (with a mode greater than 6 in (a)).<br><br>An incorrect statement, comparison or interpretation invalidates the mark, e.g.<br>• All the averages/values are bigger (with a mode smaller than 6 in (a)).</td></tr>
</table>

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th><th>Further Information</th></tr>
<tr><td rowspan="4">14</td><td>A complete trial and improvement method leading to the answer<br>($x$ =) 6.2<br><br>Must include all three marking points below.</td><td>3</td><td>Ignore the final column in the table when marking.<br><table><tr><th>$x$</th><th>$x^2 + 4x$<br>(Accept rounded or truncated values to at least 2sf)</th></tr><tr><td>6.1</td><td>61(.61)</td></tr><tr><td>6.15</td><td>62(.4225)</td></tr><tr><td>6.16</td><td>62(.5856)</td></tr><tr><td>6.17</td><td>62(.7489)</td></tr><tr><td>6.18</td><td>62(.9124)</td></tr><tr><td>6.19</td><td>63(.0761)</td></tr><tr><td>6.2</td><td>63(.24)</td></tr><tr><td>6.3</td><td>64(.89)</td></tr><tr><td>6.4</td><td>66(.56)</td></tr><tr><td>6.5</td><td>68(.25)</td></tr><tr><td>6.6</td><td>69(.96)</td></tr><tr><td>6.7</td><td>71(.69)</td></tr><tr><td>6.8</td><td>73(.44)</td></tr><tr><td>6.9</td><td>75(.21)</td></tr></table></td></tr>
<tr><td>Any correct trial of a number between 6 and 7</td><td>M1</td><td rowspan="3">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</td></tr>
<tr><td>A correct trial of $x$ where $6.15 \leq x < 6.2$</td><td>M1</td></tr>
<tr><td>6.2 in answer space.</td><td>B1</td></tr>
</table>

| Question | Answer | Marks | Further Information |
|---|---|---|---|
| 15 | 60 | **3** | |
| | 9 **and** 6<br>**or** 6 **and** 10<br>**or** 54 seen | M2 | Accept e.g.<br>• the calculations 9 × 6 or 6 × 10<br>• a sketch →  |
| | For correct unit conversion:<br>• 120 (cm) **or** 80 (cm) **or** 0.13 (m) **or** 0.115 (m) seen<br>Implied by 9600 **or** 0.01495 **or** 64(.2….) seen<br>**or** for a correct method with a consistent unit conversion error | M1 | If M2 not scored.<br><br>E.g. 1200÷13 truncated to an integer **and** 800÷11.5 truncated to an integer.<br>Note dividing two areas is not a correct method. |

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th><th>Further Information</th></tr>
<tr><td rowspan="2">16</td><td>Metal B ticked and correct supporting comparable figures, e.g.<br>• 0.07 [: 1] and 0.09 [: 1]<br>• 0.07 and 0.08<br>• [1 :] 13[.5] and [1 :] 11[.2]<br>• 112 [: 1512] and 135 [: 1512]<br>• $\frac{112}{1512}$ and $\frac{135}{1512}$<br>• $\frac{122}{1769}$ and $\frac{145}{1769}$<br>• [Metal A would be] 5 : 67[.5] or 4[.148…] : 56<br>• [Metal B would be] 2 : 22[.4] or 2[.410…] : 27</td><td>2</td><td>(Using $\frac{2}{27}$ and $\frac{5}{56}$:)<br>• Any rounding or truncation: 0.07[407…] and 0.08[928...]<br>• Any rounding or truncation: 0.92[592...] and 0.91[071...]<br>(Using $\frac{2}{29}$ and $\frac{5}{61}$:)<br>• Any rounding or truncation: 0.06[896...] and 0.08[196...]<br>• Any rounding or truncation: 0.93[103...] and 0.91[803...]<br><br>Many other values are possible, e.g.<br><table><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<br>(from 61 ÷ 29 and 5 ÷ 2)</td><td>2[.07…] … and 2.5<br>(from 56 ÷ 27 and 5 ÷ 2)</td></tr></table></td></tr>
<tr><td>One of the converted values seen.</td><td>B1</td><td></td></tr>
</table>

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

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th><th>Further Information</th></tr>
<tr><td>20</td><td>(1, 5)</td><td>1</td><td></td></tr>
<tr><td>21</td><td>36 ($cm^2$)</td><td>1</td><td></td></tr>
<tr><td>22</td><td>$1\frac{1}{5}$</td><td>1</td><td>Accept equivalent mixed numbers, e.g. $1\frac{2}{10}$<br>Do not accept $\frac{6}{5}$ or 1.2</td></tr>
<tr><td rowspan="2">23</td><td>$\frac{11}{16}$ or 0.6875 or 68.75%</td><td>2</td><td>Accept 0.69 or 69% or better.<br>Do not accept ratio or in words, e.g. 11:16, 11 in 16</td></tr>
<tr><td>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)<br><br>or for identifying the outcomes that give a score of more than 3<br>(1, 3) (2, 2) (2, 3)<br>(3, 1) (3, 1) (3, 2)<br>(3, 3) (3, 1) (3, 1)<br>(3, 2) (3, 3)<br>(allow one omission or one repeat)<br><br>or for identifying the five outcomes that give a score of 3 or less.<br>(1, 1) (1, 1) (1, 2) (2, 1) (2, 1)</td><td>M1</td><td>e.g.<br><table><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><tr><td></td><td>1</td><td>2</td><td>3</td><td>3</td></tr><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>4</td></tr><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>4</td></tr><tr><td>2</td><td>3</td><td>4</td><td>5</td><td>5</td></tr><tr><td>3</td><td>4</td><td>5</td><td>6</td><td>6</td></tr></table><br>e.g.<br><table><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> or 1 + 1 = 2<br>1 + 1 = 2<br>1 + 2 = 3<br>2 + 1 = 3<br>2 + 1 = 3<br>Accept in any order.</td></tr>
</table>

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th><th>Further Information</th></tr>
<tr><td rowspan="2">24(a)</td><td>(c =) 1.75x</td><td>2</td><td>Accept equivalent values for 1.75 e.g. $\frac{7}{4}$, $\frac{17.5}{10}$ or $1\frac{3}{4}$<br>Accept (c =) x × 1.75</td></tr>
<tr><td>Rise over run attempted, e.g. 12.5 ÷ 7, $\frac{5}{3}$</td><td>M1</td><td>Implied by a value k in the range 1.6 ≤ k ≤ 1.8<br>Award M1 if incorrect variable used, e.g. c = 1.75m</td></tr>
<tr><td>24(b)</td><td>($) 40.95<br><br>or<br><br>FT their (a) with 23.4 for x, correctly evaluated<br>or their rise over run × 23.4 correctly evaluated.</td><td>1</td><td><br><br><br><br>For the FT:<br>Accept any formula, e.g. (c =) $kx + b$, $\frac{x}{k} + b$ with $k \neq 0$, k can be 1<br>If rounded, must be correct to at least the nearest cent or to 3sf.</td></tr>
<tr><td rowspan="2">25</td><td>C A B</td><td>2</td><td>Accept for 2 marks answer: 125 cm$^2$, 125 cm$^3$, 125 cm</td></tr>
<tr><td>For any one of these values seen:<br><br>
<table>
<tr><td></td><td>A</td><td>B</td><td>C</td></tr>
<tr><td>Side length</td><td>5*</td><td></td><td>4.56…<br>rounded or truncated to at least 1dp</td></tr>
<tr><td>Surface area</td><td>150</td><td>93750</td><td></td></tr>
<tr><td>Volume</td><td></td><td>1953125</td><td>95</td></tr>
</table>
</td><td>B1</td><td>Accept sight of all of these numbers alone even if not associated with a particular cube or with SL, SA or V:<br>4.5(6…), 4.6, 150, 93750, 1953125, 95<br>Accept 93750 or 1953125 rounded or truncated<br>e.g. 93000, 2000000<br><br>*For the number 5 it needs to be associated with something, not just sight of 5 alone, e.g.<br>• Side length = 5<br>• (Cube) A = 5<br>• 5 cm<br>• $\sqrt[3]{125}$ = 5<br>• Writing 5 next to 125 cm3</td></tr>
</table>