Cambridge Assessment International Education

Cambridge Lower Secondary Checkpoint

MATHEMATICS **0862/01**

Paper 1 **April 2023**

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

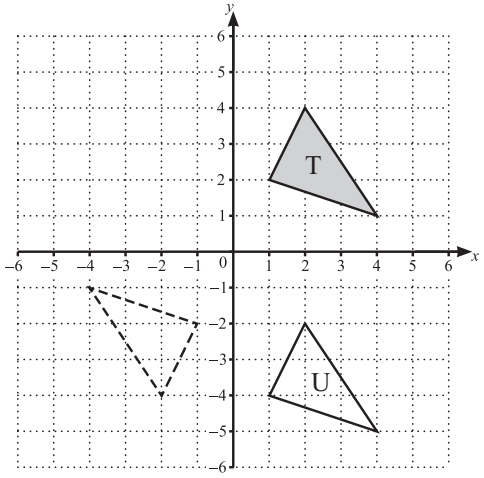
M1	method mark
A1	accuracy mark
B1	independent mark
FT	follow through after error
dep	dependent
oe	or equivalent
cao	correct answer only
isw	ignore subsequent working
soi	seen or implied

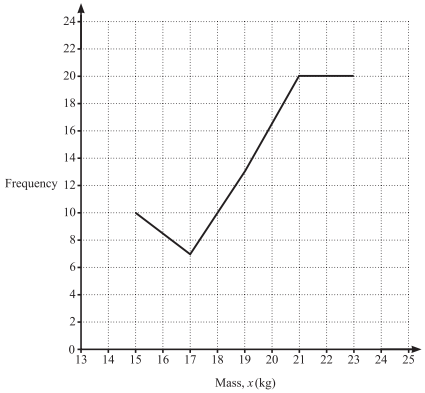
Question	Answer	Marks	Part marks	Guidance
1	☐ ✓ ☐ ✓ ☐ ☐	**1**		Both answers correct for the mark. Accept any clear indication.
2	10	**1**		$\frac{10}{60}$ scores 0 marks but '10 out of 60' scores 1 mark.
3	**Equal to 7^6**: **B**, **C** **Not equal to 7^6**: (A), **D**	**1**		All **three** answers correct for the mark. Accept calculation in place of letter, i.e. **Equal to 7^6**: **$7^5 \times 7$**, **$7^6 \div 7^0$** **Not equal to 7^6**: (7×6), **$7^2 \times 7^3$**
4	$c^2 + 14c + 40$	**2**	Award 1 mark for **three** correct out of these terms: $c^2 + 4c + 10c + 40$	For 1 mark, terms may be seen in a grid. Note $14c$ counts as **two** terms.
5	5×10^{-1} → 0.005 0.05×10^4 → 0.5 $5 \div 10^{-3}$ → 500 $0.5 \div 10^2$ → 5000	**1**		All **three** lines correct for the mark.
6	16	**2**	Award 1 mark for correctly calculating the value of the bracket as 2	1 mark implied by 2^4

Question	Answer	Marks	Part marks	Guidance
7	340 (cm^2)	**2**	Award 1 mark for [area of base =] 10 × 10 **or** 100 [cm^2] **or** [area of triangular face =] 0.5 × 10 × 12 **or** 60 [cm^2] or better.	Any attempt at a volume calculation scores 0 marks. The area of a triangular face can be implied by [total of triangular faces =] 4 × 0.5 × 10 × 12 oe **or** 240 [cm^2]
8	$\sqrt{30}$	**1**		Accept any clear indication.
9	A correct explanation, e.g. • There are no numbers on the axes/graph. • There is no label on the horizontal axis. • There is no time frame. • The line is very thick. • The line is not the same thickness throughout.	**1**		Ignore excess statements that are correct provided they are not contradictory. Accept equivalent answers, e.g. • There are no years given. • The number of people is not given. • The line **thickness** is decreasing. • The *y*-axis is not **numbered**. • There is no scale. Do **not** accept these statements alone: • No points are plotted. • There is no *x*-axis. • It does not start at 0/the beginning. • There is no information. • The *y*-axis is not **labelled**. • Because it is a curve. • The line is decreasing.
10	3	**1**		Do **not** accept $\frac{1}{3}$ or 'less than 5'

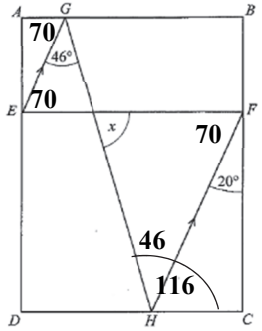
Question	Answer	Marks	Part marks	Guidance
11(a)	7×10^4	**1**		
11(b)	0.0075	**1**		
12	A correct explanation, e.g. The radiuses used for each arc are not the same.	**1**		Accept equivalent answers, e.g. • She should have used 5 cm for the arc centred on *B*. • She should not have changed the compass setting. • Both arcs should have the same radius. Do **not** accept these statements alone: • It does not produce a line in the centre of line *AB* (this does not explain why). • They are uneven (this is too vague).
13	$w = y^2 + 2$	**1**		Accept any clear indication.

Question	Answer	Marks	Part marks	Guidance
14(a)	5	**1**		Do **not** accept equivalent fractions, e.g. $\frac{105}{21}, \frac{5}{1}$
14(b)	$\frac{3}{8}$ cao	**3**	Award 2 marks for $\frac{9}{10} \times \frac{5}{12}$ **or** $\frac{9}{10} \div \frac{24}{10}$ oe **or** answer 0.375 **or** Award 1 mark for sight of $\frac{12}{5}$ **or** $\frac{5}{12}$ **or** $\frac{24}{10}$ **or** $\frac{9}{10} \times \frac{5}{\textit{their}12}$ **or** 0.9 **and** 2.4	2 marks can be implied by $\frac{9}{24}$ **or** $\frac{45}{120}$ or equivalent fraction. oe 2 marks for e.g. $\frac{45}{50} \div \frac{120}{50}, \frac{108}{120} \times \frac{50}{120}$ For 1 mark, accept equivalents. $\frac{\textit{their}12}{5}$ must be shown first.
15	32 [GB] (smallest) 500 000 [MB] 1 [TB] (largest)	**1**		Accept correct equivalent converted values on the answer lines, e.g. 32 GB, 500 GB, 1000 GB

Question	Answer	Marks	Part marks	Guidance
16(a)	Triangle at (2, –2), (1, –4), (4, –5).  	**2**	Award 1 mark for first rotation correct **or** for correctly rotating *their* first triangle 180° about (0, –3) provided it fits on the grid **or** for getting **two** vertices of triangle U correct.	Ignore labels. Mark intention. *Their* first triangle does not have to be congruent to triangle T for this rotation.
16(b)	translation	**1**	**FT** from *their* U if possible.	Accept any clear indication. For the **FT**: • *their* U must be congruent to T for the answer reflection or rotation, e.g. a right-angled triangle cannot score • *their U* must be on the grid • you must be convinced it is a transformation of triangle U, e.g. it could be labelled U, there could be two triangles with the first one correct.

Question	Answer	Marks	Part marks	Guidance
17(a)	$20 \leq x < 22$	**1**		Accept any clear indication.
17(b)	Correct frequency polygon at (15, 10), (17, 7), (19, 13), (21, 20), (23, 20).  	**2**	Award 1 mark for **five** connected consecutive points with the correct vertical plots (but incorrect horizontal plots) **or** **four** or **five** correctly plotted points (with or without connecting lines).	For 1 or 2 marks • ignore attempts to join to the axes for $x \leq 15$ or $x \geq 23$ but not horizontal lines • ignore any bars drawn • mark intention • treat extra points as choice (but mark the polygon first, their lines indicate the points they want us to mark) • ends of lines may imply points.
18(a)	54	**1**		
18(b)	$n^2 - 1$	**1**		Accept correct unsimplified equivalent answers, e.g. $n \times n + -1$

Question	Answer	Marks	Part marks	Guidance
19	Two points satisfying all **three** conditions: • Negative x-coordinate. • y-coordinate which is multiple of 4 • On the line $y = 5 – 3x$. e.g. (–1, 8), (–5, 20), (–9, 32), (–13, 44) (–17, 56), (–21, 68), (–25, 80).	**2**	Award 1 mark for **one** correct point **or** for correct values, e.g. $x = –1$ and $y = 8$ shown but coordinates not correctly written, e.g. (8, –1) or ($x = –1$, $y = 8$).	All three conditions must be correct for any marks. The x-coordinate does not have to be an integer, e.g. $\left(-2\frac{1}{3}, 12\right), \left(-3.\dot{6}, 16\right), \left(-\frac{19}{3}, 24\right)$ etc. would each score a mark. Note they should not use rounded decimals (as they would not lie on the straight line.) For the recurring notation accept, e.g. –2.3r, $-2.\overline{3}$ but not, e.g. –2.33…
20	A correct diagram with • a key including mm • a stem containing the numbers 3 to 6 in numerical order • correct ordered leaves. 3 | 1 4 7 8 4 | 0 6 7 5 | 2 5 6 | 8 Key: **3 | 1** = 31 mm	**2**	Award 1 mark for a diagram that has **either** a correct key including mm **or** has a stem containing the numbers 3 to 6 in numerical order.	For 2 marks (provided other criteria are met) or for 1 mark • accept stem in descending order • ignore extra stems • the key does not need to be based on the value 31 mm.

Question	Answer	Marks	Part marks	Guidance
21	64(°)	**2**	Award 1 mark for finding any of these angles: • *EFH* = 70 • *GHF* = 46 • *GEF* = 70 • *GHC* = 116 • *AGE* = 70 **or** for 180 – 70 – 46 oe	Check diagram for evidence of angles, e.g.  oe any correct method, e.g. 180 – (90 – 20) – 46
22	17.9 (°C)	**2**	Award 1 mark for 0.015 [per minute] **or** for finding a **correct** rate of increase, e.g. • 0.3 each 20 minutes • 0.9 per hour • 0.15 each 10 minutes • 0.75 each 50 minutes **or** for a fully correct method, e.g. • rate per minute × 120 + 16.1 • rate per hour × 2 + 16.1	1 mark for the rate could be implied by working such as • [increase =] 0.3 × 6 **or** 1.8 • a correct gradient calculation, e.g. $\frac{0.3}{20}$ • a correct calculation of a temperature at a time at or after 60 minutes, e.g. 17 (°C) at 60 minutes (or 10 am). They must show the calculation leading to their rate which arises from an inaccurate reading from the graph, e.g. $\frac{16.2-16.1}{5} \times 120 + 16.1$ (using 16.2 instead of using 16.175) gradient from triangle on graph × 120 + 16.1

Question	Answer	Marks	Part marks	Guidance
23	84	**3**	Award 2 marks for 24 **and** 60 seen **or** for 24 identified as the number of red counters **or** for fully correct method, e.g. $42 \div (3 + 4) \times 4 \times \frac{7}{2}$ oe **or** Award 1 mark for $42 \div (3 + 4) \times k$ where $k = 1$, 3 or 4 **or** for finding at least one ratio equivalent to 3 : 4 or 5 : 2	Number of red counters can be implied by, e.g. • k : 24 shown • $24 + k =$ *their* answer (working must be shown) • 60 identified as the number of green counters in Angelique's jar • [3] : 4 : 7 **and** [18] : 24 : 42 Fully correct method likely to be done in stages. 1 mark implied by, e.g. 18, $42 \div 7 = 6$ or $\overset{\times 6}{3 : 4}$ but not 6 alone. e.g. 9 : 12, 10 : 4
24	$a = 2$ $b = 5$ $h = 7$ **or** $a = 3$ $b = 4$ $h = 7$	**2**	Award 1 mark for a set of values of a, b and h which are greater than 0 and for which $(a + b)h = 49$ but does not satisfy other criteria.	For 1 mark, e.g. $a = 1$ $b = 6$ $h = 7$ $a = 5$ $b = 2$ $h = 7$ $a = 4$ $b = 3$ $h = 7$ $a = 1$ $b = 3.9$ $h = 10$ $a = 1$ $b = 48$ $h = 1$ Helpful products: $2 \times 24.5 = 49$ $4 \times 12.25 = 49$ $5 \times 9.8 = 49$ $8 \times 6.125 = 49$ Negative lengths score 0 marks.

Question	Answer	Marks	Part marks	Guidance
25	4.5	**3**	Award 2 marks for a **correct** equation which does not have x in a denominator and which has no brackets, e.g. $12 = -15 + 6x$ **or** $\frac{12}{-3} = 5 - 2x$ or better. **or** Award 1 mark for $12 = -3(5 - 2x)$.	Accept equivalent, e.g. $\frac{9}{2}$ for 3 marks. Or better, e.g. $2x = 5 - -\frac{12}{3}$ Do **not** accept a misread **which makes it easier**, e.g. 3 for –3 for 2 marks. However, you can award the 1 mark. The misread **may** be implied by $12 = 3(5 - 2x)$ or better, e.g. $12 = 15 - 6x$, $x = 0.5$

Question	Answer	Marks	Part marks	Guidance
26	0.34	**4**	Award 3 marks for [x =] $\frac{6}{25}$ **or** [x =] 0.24 oe **or** for $\frac{1 - 0.3 - 0.1}{1 + 1.5}$ **+** 0.1 oe **or** Award 2 marks for $\frac{1 - 0.3 - 0.1}{1 + 1.5}$ oe **or** Award 1 mark for forming a correct equation, e.g. $0.3 + 0.1 + x + 1.5x = 1$ oe **or** for $1 - 0.3 - 0.1$ oe **or** for *their* x + 0.1 provided *their* answer is between 0.1 and 1	Accept equivalent fractions or percentages for 4 marks, $\frac{17}{50}$ oe, or for part marks. Equivalent fractions to $\frac{16}{25}$ or 0.34 should not include decimals. Award 2 marks for $\frac{0.6}{2.5}$ seen. oe, e.g. $0.4 + 2.5x = 1$, $2.5x = 0.6$, 30**%** + 10**%** + x + 1.5x = 100**%** 1 mark implied by 0.6 oe seen anywhere. *Their x* does not have to come from correct working but needs to be clearly identified, e.g. if not equated to x they could write it underneath or next to the x in the table. Implied by their answer being 0.1 greater than *their x*.