Cambridge Assessment International Education

Cambridge Lower Secondary Checkpoint

MATHEMATICS **0862/02**

Paper 2 **October 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.

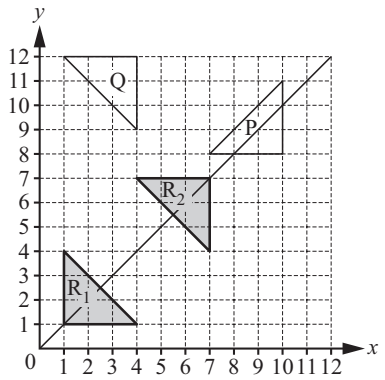
Mark scheme annotations and abbreviations

FT	follow through after error
SC	special case mark
cao	correct answer only
dep	dependent
isw	ignore subsequent working
nfww	not from wrong working
oe	or equivalent
soi	seen or implied

This document has **12** pages. Any blank pages are indicated.

Question	Answer	Marks	Part Marks	Guidance
1	360°	**1**		Accept any clear indication.
2	tonne	**1**		Accept any clear indication.
3	$(y =) 3 + x^2$ oe	**1**		
4	46 **and** 59	**2**	Award 1 mark for 35 + 11 **or** 46 **or** *their* 46 + 13 **or** 59 **or** sight of rule, i.e. square + 10 **or** $n^2 + 10$	The two terms must be in the correct order for 2 marks. 35 + 11 may be implied by first differences of 3, 5, 7, 9 and 11 but **not** just 3, 5, 7, 9 alone.
5	☑ ☐ ☐ ☑	**1**		Both answers correct for the mark. Accept any clear indication.
6	(4, –2)	**2**	Award 1 mark for *C* marked on diagram at (4, –2) **or** point *B* plotted at or seen as (4, 3) **or** $\begin{pmatrix} 3 \\ -4 \end{pmatrix}$ seen **or** *their B* correctly translated down 5 **or** answer (4, *k*) or (*k*, –2).	Must be either plotted on the grid or *their* answer correctly **FT** from *their* plotted *B*.
7	$3m + 5n = 86$	**1**		Accept any clear indication.
8	(\$)4	**2**	Award 1 mark for $\frac{12}{2}$ oe **or** $\frac{150}{15}$ oe	Implied by $k - 6$ or 6 clearly identified as cost for 1kg of strawberries, may be on graph. Implied by $10 - c$ or 10 clearly identified as cost for 1kg of raspberries, may be on graph.

Question	Answer	Marks	Part Marks	Guidance
9	15	**1**		
10	2 y w^5	**3**	Award 1 mark for each correct answer.	Accept y^1
11	68	**1**		Accept answer '68 out of 80' but do **not** accept $\frac{68}{80}$
12(a)	$x -> 2$ $x > 1$ $2x > 2$ $x > 2$ $\frac{x}{2} > 1$ $x > 3$	**1**		All **three** lines correct for the mark. Accept any clear indication.
12(b)	$x \geq -\frac{9}{2}$	**2**	Award 1 mark for a correct first step or better, e.g. • $-2x \leq 20 - 11$ • $11 \leq 2x + 20$ • $\frac{11}{2} - x \leq \frac{20}{2}$	Do **not** isw, e.g. $x \geq -\frac{9}{2}$ followed by $-\frac{9}{2}$ on the answer line scores 1 mark only. Accept equivalents for $-\frac{9}{2}$ Accept other inequality signs or = for 1 mark. $-\frac{9}{2}$ oe implies 1 mark.
13	☐ ☐ ☑ ☐ ☑ ☐	**1**		Both answers correct for the mark. Accept any clear indication.
14	(a =) 32 **or** (a =) 36	**1**		Accept (a =) 32% or (a =) 36%

Question	Answer	Marks	Part Marks	Guidance
15(a)	Rotation 90° anticlockwise (5, 7)	**3**	Award 1 mark for **each** of the three parts of the description. • rotation • 90° anticlockwise • (5, 7)	Accept equivalents for the angle description, e.g. 270(°) clockwise, 90(°) counterclockwise. If more than one transformation mentioned = 0 marks for the question. Treat extra properties as choice.
15(b)	Any suitable position. • The triangle must have a vertical and a horizontal side, each 3 squares in length. • The vertex with the right angle will be on $y = x$ so that $y = x$ is a line of symmetry, e.g.  	**1**		

Question	Answer	Marks	Part Marks	Guidance
16	Correct calculation **and** answer showing that the circumference of the larger circle is approximately 44 (cm) more than the circumference of the smaller circle, e.g. $\pi \times 2 \times (11 + 7) - \pi \times 2 \times 11$ oe **or** $36\pi - 22\pi$ **or** 113.1 – 69.1 **and** an answer in the range 43.85 to 44.1…	**2**	Award 1 mark for $\pi \times 2 \times (11 + 7)$ oe or better **or** $\pi \times 2 \times 11$ or better.	Accept values of π between 3.14 and $\frac{22}{7}$ Or better, e.g. $\pi \times 36$ or 113 to 113.1… for 1 or 2 marks. Or better, e.g $\pi \times 22$ or 69 to 69.14… for 1 or 2 marks. Accept equivalents without subtraction explicitly shown, e.g. '113.1… is about 44 more than 69.1…'

Question	Answer	Marks	Part Marks	Guidance
17	38.4 (years)	**3**	Award 2 marks for correct method to find estimated total, e.g. 25 × 34 + 35 × 18 + 45 × 28 + 55 × 20 **or** Award 1 mark for **three** correct midpoints from 25, 35, 45 and 55 seen **or** finding estimated total using consistent points within ranges.	Answer 38 with correct working scores 3 marks. isw correct answer followed by '$30 \leq A < 40$' on answer line. Implied by 850 + 630 + 1260 + 1100 **or** 3840 Implied by three correct from 850, 630, 1260 and 1100 e.g. using end points of intervals. Implied by 680 + 540 + 1120 + 1000 but **not** 3340 or 33.4 alone. Implied by 1020 + 720 + 1400 + 1200 but **not** 4340 or 43.4 alone.
18	☑ ☐ ☑	**1**		Both answers correct for the mark. Accept any clear indication.

Question	Answer	Marks	Part Marks	Guidance
19(a)	32.1 to 32.143 (cm^2)	**3**	Award 2 marks for $\frac{\pi \times \left(\frac{6}{2}\right)^2}{2}$ oe **or** Award 1 mark for $\pi \times (6 \div 2)^2$ oe **or** $\frac{6 \times 6}{2}$ oe	An answer of 32 (cm^2) with correct working scores 3 marks. Accept values of π between 3.14 and $\frac{22}{7}$ Implied by, e.g. 14[.1…] , $\frac{9\pi}{2}$, 4.5π Implied by, e.g. 28[.2…] , 28.3 , 9π Implied by 18
19(b)	8.5 (cm) **or** 8.48 to 8.49 (cm)	**2**	Award 1 mark for $6^2 + 6^2$ or better.	Accept final answer of $\sqrt{72}$ or $6\sqrt{2}$ for 2 marks. Or better, e.g. 72 , $\sqrt{6^2 + 6^2}$

Question	Answer	Marks	Part Marks	Guidance
20	Correct demonstration, e.g. • $\frac{(95-65)+(55-40)}{95+55}$ or $\frac{30+15}{150}$ or $\frac{45}{150}$ oe **and** 0.3 or 30% **or** • $\frac{65+40}{95+55}$ or $\frac{65+40}{150}$ or $\frac{105}{150}$ oe **and** 0.7 or 70% **and** 0.3 or 30% **or** • 30% of 150 = 45 oe **and** 30 + 15 = 45	**2**	Award 1 mark for 95 – 65 or 30 [= adults did **not** like] **or** 55 – 40 or 15 [= children did **not** like] **or** 45 [= total who did **not** like] **or** 95 + 55 or 150 [= total surveyed] **or** 65 + 40 or 105 [= total who liked]	Accept $\frac{30}{100}$ or $\frac{3}{10}$ for 30% or 0.3 throughout but **not** just 30 Values could be marked on diagram for 1 mark. For percentage calculations, accept e.g. $\frac{45}{150} \times 100(\%)$ Accept 30 and 15 in place of 30 + 15 without showing the addition, e.g. on the diagram.
21(a)	17 500 (km)	**1**		Do **not** accept 17 499
21(b)	0.995 (kg)	**1**		

Question	Answer	Marks	Part Marks	Guidance
22	174 to 177 (cm^2)	**3**	Award 1 mark for $2 \times \pi \times r \times 18 = 845$ oe or better **and** Award 1 mark for $\pi \times (their\ r)^2$	Accept values of π between 3.14 and $\frac{22}{7}$ Or better, e.g $[r =] \frac{845}{2\pi \times 18}$, 7.45 to 7.5 Note 36π implied by 113 to 113.1… and 18π implied by 56.5 to 56.6 Note do **not** accept $\pi \times 9^2$ or $\pi \times 18^2$ This mark is **not** spoilt by attempting to find total surface area.
23	$a = 9$ **and** $b = 11$	**3**	Award 2 marks for $x^2 - 5x + 5x - 25$ **and** $x^2 - 3x + 12x - 36$ **or** $a = 9$ **or** $b = 11$ **or** Award 1 mark for **three** correct terms out of either of these set of four terms, • $x^2 - 5x + 5x - 25$ or • $x^2 - 3x + 12x - 36$ **or** for $-36 + b = -25$	For 1 or 2 marks, accept $x^2 - 25$ or $x^2 - 5^2$ for $x^2 - 5x + 5x - 25$ and $x^2 + 9x - 36$ for $x^2 - 3x + 12x - 36$ $9x$ implies two terms correct. Alternative method: substituting in two different values of x to reach two correct simultaneous equations scores 1 mark. Correctly eliminating a variable scores next mark.

Question	Answer	Marks	Part Marks	Guidance
24	0.28 oe	**4**	Award 1 mark for 0.4 seen **and** Award 1 mark for $0.18 \div 0.6$ or better **and** Award 1 mark for *their* P(Rajiv blue) × *their* P(Safia blue).	oe, e.g. $\frac{7}{25}$, 28% Or better, e.g. [P(Safia red) =] 0.3 oe or [P(Safia blue) =] 0.7 For 0.3 or 0.7 the probabilities may be seen in a correct place on the tree diagram or in a calculation but **not** from clear wrong working, e.g. $0.6 \div 2$ This mark may be implied by an answer that is a correct **FT** from two probabilities in the correct places on the tree diagram.