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9260/1C

Paper 1C

Mark scheme

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Mark schemes are prepared by the Lead Assessment Writer and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation events which all associates participate in and is the scheme which was used by them in this examination. The standardisation process ensures that the mark scheme covers the students' responses to questions and that every associate understands and applies it in the same correct way. As preparation for standardisation each associate analyses a number of students' scripts. Alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, associates encounter unusual answers which have not been raised they are required to refer these to the Lead Examiner.

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Key to mark types and abbreviations

M	Method marks are awarded for a correct method which could lead to a correct answer.
A	Accuracy marks are awarded when following on from a correct method. It is not necessary to always see the method. This can be implied.
B	Marks awarded independent of method.
ft	Follow through marks. Marks awarded for correct working following a mistake in an earlier step.
SC	Special case. Marks awarded for a common misinterpretation which has some mathematical worth.
M dep	A method mark dependent on a previous method mark being awarded.
B dep	A mark that can only be awarded if a previous independent mark has been awarded.
oe	Or equivalent. Accept answers that are equivalent. eg accept 0.5 as well as $\frac{1}{2}$
[a, b]	Accept values between a and b inclusive.
[a, b)	Accept values $a \leq \text{value} < b$
3.14...	Accept answers which begin 3.14 eg 3.14, 3.142, 3.1416
Use of brackets	It is not necessary to see the bracketed work to award the marks.

Q	Answer	Mark	Comments
1	$\frac{12}{18}$	B1	

Q	Answer	Mark	Comments
2	$x = 125$	B1	

Q	Answer	Mark	Comments
3	18	B1	

Q	Answer	Mark	Comments
4	510.25	B1	

Q	Answer	Mark	Comments
5(a)	$5d$	B1	
	Additional Guidance		
	$\frac{20d}{4}$ or $\frac{5d}{1}$		B0

Q	Answer	Mark	Comments
5(b)	7	B1	
	Additional Guidance		
	$7w$		B0
	$\frac{21w}{3w}$ or $\frac{21}{3}$ or $\frac{7}{1}$		B0

Q	Answer	Mark	Comments
6	Alternative method 1		
	$600 \div 32$ or $18(.75)$	M1	oe
	24	A1	
	Alternative method 2		
	18×32 or 576 or 19×32 or 608	M1	oe
	24	A1	

Q	Answer	Mark	Comments
7(a)	Two numbers with a total of -3	B1	eg $0 + -3$ or $-1 + -2$ or $2 + -5$
	Additional Guidance		
	May use decimals or fractions eg $-1.5 + -1.5$		B1

Q	Answer	Mark	Comments
7(b)	Two numbers with a difference of -3	B1	eg $-3 - 0$ or $-6 - -3$ or $2 - 5$
	Additional Guidance		
	$0 - -3$		B0
	May use decimals or fractions eg $1.5 - 4.5$		B1

Q	Answer	Mark	Comments
8(a)	6	B1	

Q	Answer	Mark	Comments
8(b)	Alternative method 1		
	11 (white)	M1	
	7	A1	
	Alternative method 2		
	(5.5 – 2) or 3.5	M1	oe
	7	A1	

Q	Answer	Mark	Comments
9	$5 \times 6.5(0)$ or $32.5(0)$	M1	oe
	$54.55 - \text{their } 32.5(0) - 14.95 - 2.75$ or $54.55 - 50.2(0)$	M1dep	oe
	4.35	A1	
	Additional Guidance		
	If the answer line is blank, accept the answer in the table		

Q	Answer	Mark	Comments
10	Alternative method 1		
	70 – 25 – 17.4 or 27.6	M1	oe
	$\frac{70 - 25 - 17.4}{2}$ or 27.6 ÷ 2	M1dep	oe
	13.8	A1	oe
	Alternative method 2		
	$x + x + 25 + 17.4 = 70$	M1	oe equation any letter
	$(x =) \frac{70 - 25 - 17.4}{2}$	M1dep	oe
	13.8	A1	oe

Q	Answer	Mark	Comments
11(a)	$3n + 7$	B2	B1 $10n + 8 - 2n - (5n + 1)$ oe or $3n$ or $+ 7$
	Additional Guidance		
	If the table is blank accept the answer in the working lines		
	$10n + 8 - 2n - 5n + 1 = 3n + 9$		B1
	$n = 3n + 7$		B1

Q	Answer	Mark	Comments
11(b)	$(n =) 8$	B1	
	$5 \times \text{their } 8 + 1$	M1	ft their non-zero value for n except 16
	41	A1ft	ft their non-zero value for n except 16 must give an integer answer
	Additional Guidance		
	$(n =) 32$ Answer 161		B0 M1A1ft

Q	Answer	Mark	Comments
12(a)	5 minutes 45 seconds	B1	

Q	Answer	Mark	Comments
12(b)	21 : 54	B2	B1 21 : 45 or 15 : 42 or 15 : 24 or 14 : 52 or 14 : 25 or 12 : 54 or 12 : 45

Q	Answer	Mark	Comments
13	20 , 20 , 22	B2	any order B1 three whole numbers with a mode of 20 or a total of 62
	Additional Guidance		
	17 , 20 , 25		B1
	20 , 20 , 62		B1

Q	Answer	Mark	Comments
14	$\frac{4.2}{1.5}$ or 2.8 or $\frac{25}{1.5}$ or 16.66(...) or 16.7	M1	oe
	70	A1	

Q	Answer	Mark	Comments
15(a)	1.5 km	B1	

Q	Answer	Mark	Comments
15(b)	Horizontal line from (08:20, 2) to (08:35, 2)	B1	
	Straight line from their (08:35, 2) to (09:05, 0)	B1ft	ft their (08:35, 2) provided it gives a line with a negative gradient
	Additional Guidance		
	Tolerance for both lines is ± 1 small square		
	Accept unruled lines provided intention for straight lines is clear		
	Horizontal line from (08:20, 2) to (08:30, 2) and straight line from (08:30, 2) to (09:05, 0)		B0B1ft
	No horizontal line and straight line from (08:20, 2) to (09:05, 0)		B0B1ft
	Horizontal line from (08:20, 2) to (09:05, 2) and vertical line from (09:05, 2) to (09:05, 0)		B0B0ft

Q	Answer	Mark	Comments	
16	9612 and 9632	B3	either order B2 9612 or 9632 or 9621 and 9623 B1 9621 or 9623 or two even four-digit numbers beginning with 9 using 1, 2, 3 or 6 for the remaining digits or list of single-digit factors of 18	
	Additional Guidance			
	List of single-digit factors of 18 may include 18 and may appear on a factor tree or as pairs eg $1 \times 18, 2 \times 9, 3 \times 6$			
	For B1 repetition of digits is possible			
	A list of single-digit factors of 18 may be implied by an answer of two four-digit numbers containing all the digits 1, 2, 3, 6 and 9 and no others eg 6322 and 1169		B1	
	9326 and 9321 (uses all the digits 1, 2, 3, 6 and 9)		B1	
9326 and 9362 (two even four-digit numbers beginning with 9)	B1			

Q	Answer	Mark	Comments
17(a)	Any 2 of (0, 6) (2, 2) (4, 7) (5, 0) (5, 1) (6, 3) (8, 2) (9, 3) (10, 6)	B2	B1 (0, 6) or (2, 2) or (4, 7) or (5, 0) or (5, 1) or (6, 3) or (8, 2) or (9, 3) or (10, 6)

Q	Answer	Mark	Comments	
17(b)	(8, 1) and (5, 5) or (5, 1) and (4, 5) or (6, 5) and (3, 1) or (4, 1) and (9, 5) or (0, 5) and (1, 1)	B2	B1 two points with integer coordinates that are on the grid and make a quadrilateral with two horizontal sides eg1 (4, 5) and (9, 1) eg2 (5, 1) and (9, 5) or two points with integer coordinates that fit all criteria but one point is not on the grid eg (6, 5) and (11, 1)	
	Additional Guidance			
	Both points not on grid		B0	

Q	Answer	Mark	Comments
18	Alternative method 1		
	$0.1 \times (52 + 34)$ or 0.1×86 or $8.6(0)$ or 0.9	M1	oe
	$52 + 34 - 0.1 \times (52 + 34)$ or $0.9 \times (52 + 34)$ or $77.4(0)$	M1dep	oe eg $86 - 8.6(0)$
	$4 \times 20 - \text{their } 77.4(0)$	M1dep	oe
	$2.6(0)$	A1	
	Alternative method 2		
	0.1×52 or $5.2(0)$ or 0.1×34 or $3.4(0)$ or 0.9	M1	oe implied by $46.8(0)$ or $30.6(0)$
	$52 - 0.1 \times 52 + 34 - 0.1 \times 34$ or $0.9 \times 52 + 0.9 \times 34$ or $46.8(0) + 30.6(0)$ or $77.4(0)$	M1dep	oe
	$4 \times 20 - \text{their } 77.4(0)$	M1dep	oe
	$2.6(0)$	A1	

Q	Answer	Mark	Comments
19(a)	45	B1	

Q	Answer	Mark	Comments
19(b)	45 + 64 or any angle other than y correctly labelled 109 or $180 - (45 + 64)$ or 71 or any angle correctly labelled 71	M1	oe
	109	A1	

Q	Answer	Mark	Comments									
20(a)	<table border="1"> <tr><td>38</td><td>12</td><td>50</td></tr> <tr><td>27</td><td>23</td><td>50</td></tr> <tr><td>65</td><td>35</td><td>100</td></tr> </table>	38	12	50	27	23	50	65	35	100	B2	B1 12 correct or 65 correct or column for Brad with their 12 and 35 – their 12 or row for Brad with 50 – their 23, 35 – their 12 and 50
	38	12	50									
	27	23	50									
65	35	100										
Additional Guidance												
<table border="1"> <tr><td>38</td><td>22</td><td>50</td></tr> <tr><td>37</td><td>13</td><td>50</td></tr> <tr><td>75</td><td>35</td><td>100</td></tr> </table> <p>column for Brad with correct follow through</p>	38	22	50	37	13	50	75	35	100	B1		
38	22	50										
37	13	50										
75	35	100										
<table border="1"> <tr><td>38</td><td>22</td><td>50</td></tr> <tr><td>27</td><td>23</td><td>50</td></tr> <tr><td></td><td></td><td>100</td></tr> </table> <p>row for Brad correct</p>	38	22	50	27	23	50			100	B1		
38	22	50										
27	23	50										
		100										

Q	Answer	Mark	Comments
20(b)	0.35 (× 40)	M1	oe eg $\frac{40}{100} \times 35$
	14	A1	

Q	Answer	Mark	Comments
21	$\begin{pmatrix} -5 \\ 0 \end{pmatrix}$	B1	

Q	Answer	Mark	Comments
22	(0, 7)	B1	

Q	Answer	Mark	Comments
23	18	B1	

Q	Answer	Mark	Comments
24(a)	Three or four of (32.5, 38), (37.5, 22), (42.5, 10), (47.5, 6) correctly plotted or four points with correct frequencies consistently positioned at or between the class boundaries	M1	$\pm \frac{1}{2}$ small square
	(32.5, 38), (37.5, 22), (42.5, 10) and (47.5, 6) correctly plotted and joined with straight lines to form a frequency polygon	A1	$\pm \frac{1}{2}$ small square
	Additional Guidance		
			M1A1
	Mark intention for straight lines		
	Ignore (32.5, 38) joined to (0, 0) or to (25, 0) or to (27.5, 0) or to (30, 0) and ignore (47.5, 6) joined to (50, 0) or to (52.5, 0) or to (55, 0) but any other extra lines score A0		
	Extra points may be ignored if not used to make the polygon		
	Plots (30, 38), (35, 22), (40, 10), (45, 6) ie all points plotted at lower boundaries		M1
Plots (30, 38), (35, 22), (40, 10), (50, 6) ie three points plotted at lower boundaries and one at upper boundary		M0	
Histogram and frequency polygon, mark the frequency polygon			
Histogram			M0A0

Q	Answer	Mark	Comments
24(b)	$\frac{4}{76+4} (\times 100)$ or $\frac{4}{38+22+10+6+4} (\times 100)$ or $\frac{4}{80} (\times 100)$	M1	oe
	5	A1	
	Additional Guidance		
	5 from $\frac{4}{76} = 5.26$		M0A0

Q	Answer	Mark	Comments
25	3.8×10^4 5.3×10^4 1.6×10^7 with no incorrect conversion seen	B2	B1 reverse order with no incorrect conversion seen or one correct conversion seen
	Additional Guidance		
	38 000 53 000 16 000 000		B2
	Condone smallest 3.8×10^4 and largest 1.6×10^7 with no incorrect conversion seen (middle value implied)		B2

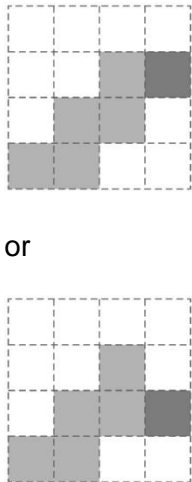
Q	Answer	Mark	Comments
26(a)	$8n - 13$ or $-13 + 8n$	B2	oe eg $-5 + 8(n - 1)$ B1 $8n (\dots)$
	Additional Guidance		
	Condone eg $T_n = 8n - 13$ or $n = 8n - 13$		B2
	Allow other variables eg $8x - 13$		B2
	$-5 + 8n$		B1
	$-13 + 8(n - 1)$		B1
	$n8 \dots$		B1
	$n8 - 13$		B1
	$13n - 8$		B0
	$8n - 13n$		B0
	$n - 8$		B0

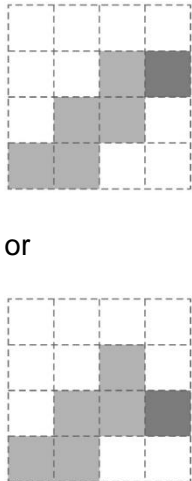
Q	Answer	Mark	Comments
26(b)	$\frac{48 - 5^2}{5} + \frac{48 - 6^2}{6}$ or 4.6 or $\frac{23}{5}$ or $4\frac{3}{5}$ or 2	M1	oe
	6.6 or $\frac{33}{5}$ or $6\frac{3}{5}$	A1	

Q	Answer	Mark	Comments	
27	$(6 - 2) \times 180$ or $\left(180 - \frac{360}{6}\right) \times 6$ or 720	M1	oe	
	110	A1		
	Additional Guidance			
	720 embedded eg $\frac{720}{5}$			M1A0
	(6 - 2) × 180 embedded			M1A0

Q	Answer	Mark	Comments
	$y = \frac{1}{x}$ → A reciprocal function $y = x - 1$ → A line with gradient 1 $y = x^2$ → y has no negative values $y = x^3 + 1$ → A curve passing through (0, 1)	B4	B1 each correct match
Additional Guidance			
28	<div style="display: flex; flex-direction: column; gap: 10px;"> <div style="border: 1px solid black; padding: 5px; width: fit-content;">$y = \frac{1}{x}$</div> <div style="border: 1px solid black; padding: 5px; width: fit-content;">$y = -1$</div> <div style="border: 1px solid black; padding: 5px; width: fit-content;">$y = x - 1$</div> <div style="border: 1px solid black; padding: 5px; width: fit-content;">$y = x^2$</div> <div style="border: 1px solid black; padding: 5px; width: fit-content;">$y = x^3 + 1$</div> </div>	<div style="display: flex; flex-direction: column; gap: 10px;"> <div style="border: 1px solid black; padding: 5px; width: fit-content;">A horizontal line</div> <div style="border: 1px solid black; padding: 5px; width: fit-content;">A line with gradient 1</div> <div style="border: 1px solid black; padding: 5px; width: fit-content;">A vertical line</div> <div style="border: 1px solid black; padding: 5px; width: fit-content;">A curve passing through (0, 1)</div> <div style="border: 1px solid black; padding: 5px; width: fit-content;">A reciprocal function</div> <div style="border: 1px solid black; padding: 5px; width: fit-content;">y has no negative values</div> </div>	B4
Two lines from an equation is choice			

Q	Answer	Mark	Comments	
29	$(1 \times) 66 + 3 \times 26 + 5 \times 20 + 7 \times 8$ or $66 + 78 + 100 + 56$ or 300	M1	may be seen in table allow one error	
	$(\text{their } 66 + \text{their } 78 + \text{their } 100 + \text{their } 56) \div 120$ or their $300 \div 120$ or 2.5	M1dep	oe condone bracket error if working seen eg $66 + 78 + 100 + 56 \div 120$	
	2 hours 30 minutes	A1	SC2 244 hours 28 minutes SC1 $244.4\dot{6}$	
	Additional Guidance			
	One error may be a consistent error in the midpoints eg using 2, 4, 6 and 8			
Correct products and sum seen in the table but a different method not using their products is choice			M0M0A0	

Q	Answer	Mark	Comments
30(a)		B1	mark intention

Q	Answer	Mark	Comments
30(b)		B1	must be different to part (a) mark intention

Q	Answer	Mark	Comments
31	Alternative method 1		
	$\pi \times 5 \times 5$ or 25π or [78.5, 78.55] or $3 \times \pi \times 5 \times 5$ or 75π or [235.5, 235.65]	M1	oe
	$20 \times 20 - 10 \times 10$ or $400 - 100$ or 300	M1	oe eg $20 \times 10 + 10 \times 10$ or $3 \times 10 \times 10$
	their $300 - 3 \times \pi \times 5 \times 5$ or $300 - 75\pi$	M1dep	oe dep on M2
	[64.35, 64.5]	A1	
	Alternative method 2		
	$\pi \times 5 \times 5$ or [78.5, 78.55]	M1	oe
	$10 \times 10 - \text{their [78.5, 78.55]}$ or $100 - \text{their [78.5, 78.55]}$ or [21.45, 21.5]	M1dep	oe
	$3 \times \text{their [21.45, 21.5]}$	M1dep	oe
	[64.35, 64.5]	A1	