# wjec cbac

## **GCSE MARKING SCHEME**

**AUTUMN 2023** 

GCSE MATHEMATICS UNIT 2 – INTERMEDIATE TIER 3300U40-1

#### INTRODUCTION

This marking scheme was used by WJEC for the 2023 examination. It was finalised after detailed discussion at examiners' conferences by all the examiners involved in the assessment. The conference was held shortly after the paper was taken so that reference could be made to the full range of candidates' responses, with photocopied scripts forming the basis of discussion. The aim of the conference was to ensure that the marking scheme was interpreted and applied in the same way by all examiners.

It is hoped that this information will be of assistance to centres but it is recognised at the same time that, without the benefit of participation in the examiners' conference, teachers may have different views on certain matters of detail or interpretation.

WJEC regrets that it cannot enter into any discussion or correspondence about this marking scheme.

### WJEC GCSE MATHEMATICS

#### **AUTUMN 2023 MARKING SCHEME**

GCSE Mathematics		
Unit 2: Intermediate Tier	Mark	Comments
1. (a) 3.5 pints	B1	Commente
1.(b) 20 miles	B1	
2.(a) 55% or 0.55 or <u>55</u> or <u>11</u> or equivalent 100 20	B1	Allow 55. Do not accept 0.55%.
2.(b) $\frac{1}{2}$	B1	
3.(a) $8a = 27.5 - 3.5$ or $8a = 24$ a = 3	B1 B1	Mark final answer. FT from $8a = k$ . Unsupported correct answer implies B1B1. Award B1B0 for a final answer of $24 \div 8$ or $\frac{24}{8}$ . If FT leads to a whole number answer, it must be shown as a whole number. Otherwise, accept a fraction or a decimal, either rounded or truncated. Allow B1B1 for a correct embedded answer BUT only B1B0 if contradicted by $a \neq 3$ or equivalent.
3.(b)(i) $-22.5 \text{ or } -\frac{45}{2} \text{ or equivalent}$ ISW	B1	
3.(b)(ii) A correct expression: • $5(n-6)$ • $5n-30$ • $5 \times (n-6)$ • $(n-6) \times 5$	B2	Mark final answer for B2. Must include brackets or be fully simplified for B2. Allow $(n - 6)5$ for B2. Award B1 for sight of one of the following: • $n - 6 \times 5$ • $5 \times n - 6$ • a correct expression with incorrect final answer, e.g. $5(n - 6) = 5n - 6$ . Award B0 for unsupported • $n - 30$ • $5n - 6$ .

		r	T
4.	9.2	B2	Answer line takes precedence. Award B2 for all three clues satisfied.
			Award B1 for one of the following on the answer line: • 6.9 • 11.5 • 84.64 • 9.2 <sup>2</sup>
			Award B2 if answer line is blank but a <b>final</b> answer of $9.2$ is clearly embedded (e.g. $9.2^2$ ) in the working space.
			Award B1 if a final answer of 9.2 is contradicted on the answer line (e.g. $9.2^2 = 84.64$ in working space, but 84.64 is written on the answer line).
5.(a)	120	B2	<b>120 must come from correct working.</b> Unsupported 120 is awarded B2.
			<ul> <li>Award B1 for one of the following:</li> <li>sight of 117(.0631) rounded or truncated.</li> <li>an answer of 120 from 117</li> </ul>
5.(b)	141-2	B2	<b>141-2 must come from correct working.</b> Unsupported 141-2 is awarded B2.
			Award B1 for one of the following: • 141( $\cdot$ 183) rounded or truncated • $\frac{74\sqrt{91}}{5}$ • an answer of 141.2 correctly rounded from
			141·1 Or 141·2
6.	(Hours worked on Friday = ) $4.5$ (hours)	B2	Answer space takes precedence. Mark final answer. Accept 4 <sup>1</sup> / <sub>2</sub> (hours).
			<ul> <li>Award B1 for sight of one of the following:</li> <li>Correct time given but not in hours (e.g 4 hours 30 mins, 270 minutes)</li> <li>9 (hours for M,T,W) from correct working</li> <li>method to arrive at hours for full day (e.g. 4x = 36)</li> <li>method to arrive at hours for half day (e.g. 8y = 36)</li> <li>4.5 seen but then incorrect workings seen (e.g 4 hours 50 minutes, 4 hours 30).</li> </ul>

7. (a) Correct translation	B1	
7. (b) Correct reflection in $y = 1$ .	B2	<ul> <li>Award B1 for one of the following:</li> <li>correct reflection in x = 1</li> <li>sight of the line y = 1 unambiguously indicated.</li> </ul>

8. (Length of A = 35 cm ÷ 5 × 2 = ) 14 (cm)	B1	Check diagram for answers. Not from incorrect working.
(Total length of B and C = $35 - 14 = $ ) 21 (cm)	B1	FT 35 – 'their 14'. Not from incorrect working.
(Length of B =) $21 \div (1 + 6)$ <b>OR</b> (Length of C =) $21 \div (1 + 6) \times 6$	M1	Strict FT 'their 21' (including 35 and 14) ÷ 7
(Length of B =) 3 (cm) AND (Length of C =) 18 (cm)	A1	Sight of 3 or 18 implies M. FT 'their 21' $\div$ 7 × 6.
		Penalise -1 only once if their A, B or C labelled incorrectly.
8. Alternative method		Check diagram for answers.
(Total length of B and C = $35 \text{ cm} \div 5 \times 3 = 21 \text{ (cm)}$	B1	Not from incorrect working.
(Length of A = 35 – 21 = ) 14 (cm)	B1	Not from incorrect working. FT 35 – 'their 21'
(Length of B =) $21 \div (1 + 6)$ <b>OR</b> (Length of C =) $21 \div (1 + 6) \times 6$	M1	<u>Strict FT</u> 'their 14' (including 35 and 14) ÷ 7
(Length of $B =$ ) 3 (cm) <b>AND</b> (Length of $C =$ ) 18 (cm)	A1	Sight of 3 or 18 implies M1 FT 'their 21' $\div$ 7 $\times$ 6.
		Penalise -1 only once if their A, B or C labelled incorrectly.
Organisation and Communication.	OC1	<ul> <li>For OC1, candidates will be expected to:</li> <li>present their response in a structured way</li> <li>explain to the reader what they are doing at each step of their response</li> <li>lay out their explanation and working in a way that is clear and logical</li> <li>write a conclusion that draws together their results and explains what their answer means</li> </ul>
Accuracy of writing.	W1	<ul> <li>For W1, candidates will be expected to:</li> <li>show all their working</li> <li>make few, if any, errors in spelling, punctuation and grammar</li> <li>use correct mathematical form in their working</li> <li>use appropriate terminology, units, etc</li> </ul>

9. (a)		x = 2 drawn		P1	Award P0 if other lines are drawn unless $x = 2$ is unambiguously indicated. Ignore the line $y = 8$ drawn from (0,8) to the given line.	
				Their line must be drawn must at least 5 small squares in length.		
9. (b)	b) (2 , 8)		B1	FT correct intersection of 'their drawn straight line $x = 2$ ' and the given line.		
10.	0.					
		£36	£92			
	10%	£3.60	£9.20			Numbers shown in the boxes take precedence. If answer boxes are left blank allow unambiguous indication of their three answers.
	13.5%	£4.86	£12.42			
	10%		£92(.00)		B1 B1	FT 9.2 ÷ 'their 0·1' (i.e. 'their 10%').
		36 × 0·135 or	equivalent		M1	Allow 36 × <u>13·5</u> or equivalent for M1.
			£4.8	86	A1	
11.						Check diagram for answers.
(Radius	(Radius of smaller circle =) 4 (cm) <b>AND</b> (Radius of larger circle = 4 + 2 =) 6 (cm)		m)	B1	May be seen or implied in later working.	
(Width o	Vidth of rectangle = $8 + 2 + 2$ or $6 + 6 = 12$ (cm) <b>AND</b> Length of rectangle = $8 + 2 + 2 + 8$ or $6 + 6 + 8 = 120$ 20 (cm)		m) = ) (cm)	B1	May be seen or implied in later working. Implies previous B1. FT 2 × 'their 6'. FT 8 + 2 × 'their 6'.	
(SI or	(Shaded area =) $20 \times 12 - \pi \times 4^2 - \pi \times 6^2$ or $(12 \times 12) - \pi \times 6^2 + (12 \times 8) - \pi \times 4^2$		M2	FT 'their 12(cm)' and 'their 20(cm)' for a possible M2 and possible A1. FT 'their 4(cm)' and 'their 6(cm)' for a possible M2 A0. If a 12 x 12 square and 12 x 8 rectangle used, the previous B1 is implied. Award M1A0 for sight of any of the following (FT 'their 12(cm)', 'their 20(cm)', 'their 4(cm)' and 'their 6(cm)'): • (Area of the smaller circle =) $\pi \times 4^2$ (= 50·265cm <sup>2</sup> ) • (Area of the larger circle =) $\pi \times 6^2$ (= 113·097 cm <sup>2</sup> ) • (Shaded area =) 20 x 12 - $\pi \times x^2 - \pi \times y^2$		
Accept	answers	in the range 76.	6 to 76·72 (cm²) or 240 – 52π (c	m²)	A1	Allow 77 (cm <sup>2</sup> ) from correct working.

12.(a) 110(°)	B1	Award B1 for an answer in the range 108(°) to 112(°).
12.(b) 335(°)	B1	Award B1 for an answer in the range 333(°) to 337(°).
13.(a) 1 10	B2	B1 for each. Table takes precedence if conflicting values given.
13.(b) At least 4 correct plots and no incorrect plot.	P1	FT 'their ( $-2$ ,1)' and 'their (1,10)' OR ( $-2$ ,1) and (1,10) plotted. Allow ± ' $\frac{1}{2}$ a small square'.
A smooth <u>curve</u> drawn through their plots.	C1	FT 'their 6 plots'. OR a curve through the 4 given points <b>AND</b> $(-2,1)$ and $(1,10)$ Allow intention to pass through their plots. $(\pm 1 \text{ small square horizontally or vertically.})$
14. (a) (Area =) $\frac{7 \cdot 4 + 9 \cdot 1}{2} \times 5 \cdot 7$ or equivalent	M1	(= $47.025$ ) May be seen in stages. Allow M1 for correct intent <u>seen</u> . e.g. 7.4 + 9.1 × 5.7 ÷ 2
× 15·6	m1	
Allow an answer from 733 to 734 (cm <sup>3</sup> ) inclusive.	A1	CAO Note: 733·59 or 733·6 (cm³)
14. (b) 733·59 × 19·3	M1	FT 'their volume from (a)' × 19·3
14158(·287 (g))	A1	
Allow an answer from 14.1 to 14.2 (kg) inclusive.	B1	FT 'their 14158·287' ÷ 1000 Allow 14 from correct working. <i>Note: 14·158(287) or 14·16 or 14·2 (kg)</i>
14.(b) Alternative method (converting to g first)		
0·0193 (kg/cm³) 733·59 × 0·0193	B1 M1	FT 'their volume from (a)' and FT 'their 0.0193' provided a place value error has been made.
Allow an answer from 14.1 to 14.2 (kg) inclusive	A1	Allow 14 from correct working. Note: 14.158(287) or 14.16 or 14.2 (kg)

15. Identifying or implying that there are 16 possible correct combinations (e.g 2 × 6) or products (e.g.12)	B1	Award B1 for • simply stating 16 • $(4 \times 4 =)16$ • <b>completed</b> sample space (need not be correct) • sight of $\frac{1}{4} \times \frac{1}{4}$ • sight of 16 in a denominator.
Identifies <u>all</u> possible combinations (e.g 2 × 6) or products (e.g 12) that are a factor of 36 $1 \times 6 = 6$ , $1 \times 9 = 9$ , $2 \times 6 = 12$ $2 \times 9 = 18$ , $3 \times 6 = 18$ , $4 \times 9 = 36$	B2	<ul> <li>FT 'their 16 possible correct products'. If products not used (e.g 2 + 6 = 8), do not award B2 or B1.</li> <li>Award B2 for clearly identifying one of the following: <ul> <li>the 6 (and no more) combinations</li> <li>1 × 6, 2 × 9, etc that form factors of 36 that can be achieved by the two spinners</li> <li>the 6 (and no more) products of factors of 36 that can be achieved by the two spinners if that can be achieved by the two spinners</li> <li>the 6 (and no more) products of factors of 36 that can be achieved by the two spinners: 6, 9, 12, 18, 18, 36</li> <li>sight of 6 × <sup>1</sup>/<sub>4</sub> × <sup>1</sup>/<sub>4</sub> or equivalent.</li> </ul> </li> </ul>
(Probability factor of 36 =) <u>6</u> or equivalent. ISW 16	В1	<ul> <li>Award B1 for clearly identifying one of the following: <ul> <li>at least 4 combinations that are factors of 36</li> <li>at least 4 products of factors of 36 that can be achieved by the two spinners:</li> <li>6, 9, 12, 18, 36</li> <li>all of the factors of 36 (1,2,3,4,6,9,12,18,36).</li> </ul> </li> <li>FT 'their list' only if at least 12 combinations or products given with at least two factors of 36 that can be achieved by the two spinners clearly identified.</li> <li>Penalise, -1, any incorrect notation e.g. '6 out of 16'.</li> <li>Unsupported 6 or 3 or equivalent gains B1 B2 B1. 16 8</li> </ul>

16. $(AC^2 = ) 8^2 + 4.5^2$ or equivalent	M1	Check diagram. note: $(AC^2 =) 64 + 20.25$ .
$(AC =) \sqrt{8^2 + 4.5^2}$ or equivalent	m1	note: (AC =) $\sqrt{84.25}$ . FT $$ 'their 84.25' for m1 only provided M1 gained.
9·18 (cm)	A2	Mark final answer for A2. CAO.
		Award A1 for one of the following: • $9.17(878)$ rounded or truncated to at least one decimal place • $\frac{\sqrt{337.}}{2}$ Final answer of • <b>AC</b> = 84.25 is M1m0A0.
16. <u>Alternative method to find AC using Trig</u> A correct and complete method (using trigonometric relationships) (AC =) 9.18 (cm)	M2 A2	CAO. Mark final answer. Award A1 for one of the following: • 9·17(878) rounded or truncated to at least
		one decimal place • <u>√337.</u> 2

17.		Correct eva	aluation regard	ded as enou	gh to identify if
One correct evaluation $3 \le x \le 4$	B1	< 80 or > 8	80.		<b>o</b>
2 correct evaluations $3.75 \le x \le 3.95$ ,	B1	lf evaluatio	ns not seen ad	ccept 'too hi	gh' or 'too low'.
(one value < 80, one value > 80)		Look out fo	$5x^3 + 6x - 80 =$	= 0	
2 correct evaluations $3.75 \le r \le 3.85$	M1		-3 - 6		
(one value $< 80$ one value $> 80$ )	1011	$\frac{x}{2}$	$\frac{x+6x}{45}$		
		3	45		
x = 3.8	A1	3.1	48.391		
		3.2	51.968		
		3.3	55.737		
		3.4	59.704		
		3.5	63.875		
		3.6	68.256	3.75	75.2343
		3.7	72.853	3.84	79.6631
		3.8	77.672	3.85	<b>80</b> ·1666
		3.9	82.719	3.95	85.3298
		4	88		
		1.1			0.1010
		Unsupport	ed $x = 3.8$ is a	warded BUE	
		An answer	of $x = 3.8$ can	n only be aw	arded M1A1,
			1911 OF 2 CORREC	st evaluation	IS
		$575 \leq x \leq 3$	$1000$ $\sim 80$ or	no ovaluatio	n > 80)
				ic evaluation	<i>ii &gt;</i> 00).
		If 3.85 is gi	iven as 80 (tru	ncated) awa	ard M0 A0 unless
		the end in the last		indicated	
		loo nign o	r equivalent is	mulcaleu.	
19. Sight of $(5x+3)(2x-1)$ or $2(5x+3)(2x-1)$	<u>S1</u>	Intention to	$(2 \times)$ width $\times$	Indicated.	
18. Sight of $(5x + 3)(2x - 1)$ or $2(5x + 3)(2x - 1)$	S1	Intention to Allow 4 x v	$(2 \times)$ width $\times$	length.	t for S1.
18. Sight of $(5x + 3)(2x - 1)$ or $2(5x + 3)(2x - 1)$ or equivalent	S1	Intention to Allow 4 × v May be imp	$\overline{(2 \times)}$ width $\times$ width $\times$ length oplied in later wo	length. or equivalen orking if B2	t for S1. or B1 awarded.
18. Sight of $(5x + 3)(2x - 1)$ or $2(5x + 3)(2x - 1)$ or equivalent	S1	Intention to Allow 4 × v May be imp	or equivalent is $(2 \times)$ width $\times$ vidth $\times$ length oplied in later w	length. or equivalen orking if B2	t for S1. or B1 awarded.
18. Sight of $(5x + 3)(2x - 1)$ or $2(5x + 3)(2x - 1)$ or equivalent (total area of both rectangles = $20x^2 + 2x - 6$ (cm <sup>2</sup> )	S1 B2	Intention to Allow 4 × v May be imp	or equivalent is $\overline{(2 \times)}$ width $\times$ vidth $\times$ length of plied in later we answer for B2.	length. or equivalen orking if B2	t for S1. or B1 awarded.
18. Sight of $(5x + 3)(2x - 1)$ or $2(5x + 3)(2x - 1)$ or equivalent (total area of both rectangles = $20x^2 + 2x - 6$ (cm <sup>2</sup> )	S1 B2	Intention to Allow 4 × v May be imp Mark final a Allow $20x^2$	or equivalent is $(2 \times)$ width $\times$ width $\times$ length of plied in later we answer for B2. +2x + -6 for	length. or equivalen orking if B2 B2.	t for S1. or B1 awarded.
18. Sight of $(5x + 3)(2x - 1)$ or $2(5x + 3)(2x - 1)$ or equivalent (total area of both rectangles = $20x^2 + 2x - 6$ (cm <sup>2</sup> )	S1 B2	Intention to Allow 4 × w May be imp Mark final a Allow $20x^2$	or equivalent is $(2 \times)$ width $\times$ width $\times$ length of plied in later we answer for B2. +2x + -6 for for sight of one	length. or equivalen orking if B2 B2.	t for S1. or B1 awarded.
18. Sight of $(5x + 3)(2x - 1)$ or $2(5x + 3)(2x - 1)$ or equivalent (total area of both rectangles = $20x^2 + 2x - 6$ (cm <sup>2</sup> )	S1 B2	Intention to Allow 4 × v May be imp Mark final a Allow $20x^2$ Award B1 f	or equivalent is $\overline{p(2 \times)}$ width $\times$ width $\times$ length of plied in later we answer for B2. +2x + -6 for for sight of one $r^2 + 12r - 10r$	length. or equivalen orking if B2 B2. e of the follow	t for S1. or B1 awarded. wing:
18. Sight of $(5x + 3)(2x - 1)$ or $2(5x + 3)(2x - 1)$ or equivalent (total area of both rectangles = $20x^2 + 2x - 6$ (cm <sup>2</sup> )	S1 B2	Intention to Allow 4 × v May be imp Mark final a Allow $20x^2$ Award B1 f	or equivalent is $\overline{p(2 \times)}$ width $\times$ width $\times$ length of plied in later we answer for B2. + 2x + -6 for for sight of one $x^2 + 12x - 10x$ t of the four co	length. or equivalen orking if B2 B2. e of the follow – 6 with at l	t for S1. or B1 awarded. wing: east three terms
18. Sight of $(5x + 3)(2x - 1)$ or $2(5x + 3)(2x - 1)$ or equivalent (total area of both rectangles = $20x^2 + 2x - 6$ (cm <sup>2</sup> )	S1 B2	Intention to Allow 4 × v May be imp Mark final a Allow $20x^2$ Award B1 f 20. our	or equivalent is $(2 \times)$ width $\times$ width $\times$ length of plied in later we answer for B2. + 2x + -6 for for sight of one $x^2 + 12x - 10x$ t of the four co $x^2 + 6x - 5x - 5x$	length. or equivalen orking if B2 B2. e of the follow – 6 with at l prrect (must l	t for S1. or B1 awarded. wing: east three terms have $x^2$ term)
18. Sight of $(5x + 3)(2x - 1)$ or $2(5x + 3)(2x - 1)$ or equivalent (total area of both rectangles = $20x^2 + 2x - 6$ (cm <sup>2</sup> )	S1 B2	Intention to Allow 4 × v May be imp Mark final a Allow $20x^2$ Award B1 f • 20. our • 10.	or equivalent is $(2 \times)$ width $\times$ width $\times$ length of plied in later we answer for B2. + 2x + - 6 for for sight of one $x^2 + 12x - 10x$ t of the four co $x^2 + 6x - 5x - 3$	length. or equivalen orking if B2 B2. e of the follow – 6 with at I prrect (must I 3	t for S1. or B1 awarded. wing: east three terms have $x^2$ term)
18. Sight of $(5x + 3)(2x - 1)$ or $2(5x + 3)(2x - 1)$ or equivalent (total area of both rectangles = $20x^2 + 2x - 6$ (cm <sup>2</sup> )	S1 B2	Intention to Allow 4 × v May be imp Mark final a Allow $20x^2$ Award B1 f • 20. ou • 10. • 2(1	or equivalent is $\overline{(2 \times)}$ width $\times$ width $\times$ length of plied in later we answer for B2. + 2x + - 6 for for sight of one $x^2 + 12x - 10x$ t of the four co $x^2 + 6x - 5x - 3$ $10x^2 + x - 3$ $x^2 + x - 3$	Indicated. Iength. or equivalen orking if B2 B2. B2. of the follow - 6 with at I prrect (must I 3	t for S1. or B1 awarded. wing: east three terms have $x^2$ term)
18. Sight of $(5x + 3)(2x - 1)$ or $2(5x + 3)(2x - 1)$ or equivalent (total area of both rectangles = $20x^2 + 2x - 6$ (cm <sup>2</sup> )	S1 B2	Intention to Allow 4 × v May be imp Mark final a Allow $20x^2$ Award B1 f • 20. our • 10. • 2(1) • 10. • 40.	or equivalent is $\overline{p(2 \times)}$ width $\times$ width $\times$ length of plied in later we answer for B2. + 2x + -6 for for sight of one $x^2 + 12x - 10x$ t of the four co $x^2 + 6x - 5x - 3$ $10x^2 + x - 3$ $x^2 + 4x - 12$	Indicated. Iength. or equivalen orking if B2 B2. e of the follow – 6 with at I prrect (must I 3	t for S1. or B1 awarded. wing: east three terms have $x^2$ term)
18. Sight of $(5x + 3)(2x - 1)$ or $2(5x + 3)(2x - 1)$ or equivalent (total area of both rectangles = $20x^2 + 2x - 6$ (cm <sup>2</sup> )	S1 B2	Intention to Allow $4 \times w$ May be imp Mark final a Allow $20x^2$ Award B1 f $20x^2$ Award B1 f $20x^2$ $10x^2$ $10x^2$ $40x^2$	or equivalent is x (2 x) width x width x length c plied in later we answer for B2. + 2x + - 6 for for sight of one $x^2 + 12x - 10x$ t of the four co $x^2 + 6x - 5x - 3$ $10x^2 + x - 3$ $x^2 + 4x - 12$ .	length. or equivalen orking if B2 B2. e of the follow – 6 with at I prrect (must I 3	t for S1. or B1 awarded. wing: east three terms have $x^2$ term)
18. Sight of $(5x + 3)(2x - 1)$ or $2(5x + 3)(2x - 1)$ or equivalent (total area of both rectangles = $20x^2 + 2x - 6$ (cm <sup>2</sup> )	S1 B2	Intention to Allow $4 \times v$ May be imp Mark final a Allow $20x^2$ Award B1 f $20x^2$ Award B1 f $20x^2$ $10x^2$	or equivalent is $\overline{p(2 \times)}$ width $\times$ width $\times$ length of plied in later we answer for B2. + 2x + -6 for for sight of one $x^2 + 12x - 10x$ t of the four co $x^2 + 6x - 5x - 3$ $x^2 + x - 3$ $x^2 + 4x - 12$ . s, award SC1 for	Indicated. Iength. or equivalen orking if B2 B2. e of the follow – 6 with at I orrect (must I 3 or one of the	t for S1. or B1 awarded. wing: east three terms have $x^2$ term)
18. Sight of $(5x + 3)(2x - 1)$ or $2(5x + 3)(2x - 1)$ or equivalent (total area of both rectangles = $20x^2 + 2x - 6$ (cm <sup>2</sup> )	S1 B2	Intention to Allow $4 \times w$ May be imp Mark final a Allow $20x^2$ Award B1 f $20x^2$ Award B1 f $20x^2$ $10x^2$	or equivalent is $\overline{p(2 \times)}$ width $\times$ width $\times$ length of plied in later we answer for B2. + 2x + -6 for for sight of one $x^2 + 12x - 10x$ t of the four co $x^2 + 6x - 5x - 3$ $10x^2 + x - 3$ $x^2 + 4x - 12$ . s, award SC1 for $x^2 + 24x - 20x$	length. or equivalen orking if B2 B2. e of the follow – 6 with at l orrect (must l 3 or one of the – 12.	t for S1. or B1 awarded. wing: east three terms have $x^2$ term)
18. Sight of $(5x + 3)(2x - 1)$ or $2(5x + 3)(2x - 1)$ or equivalent (total area of both rectangles = $20x^2 + 2x - 6$ (cm <sup>2</sup> )	S1 B2	Intention to Allow $4 \times w$ May be imp Mark final a Allow $20x^2$ Award B1 f $20x^2$ Award B1 f $20x^2$ If no marks $40x^2$	or equivalent is $\overline{p(2 \times)}$ width $\times$ length of plied in later we answer for B2. + 2x + -6 for for sight of one $x^2 + 12x - 10x$ t of the four co $x^2 + 6x - 5x - 3$ $10x^2 + x - 3$ $x^2 + 4x - 12$ . s, award SC1 for $x^2 + 24x - 20x$ $x^2 + 22x + 6$ for	length. or equivalen orking if B2 B2. e of the follow – 6 with at l prrect (must l 3 or one of the – 12. om $2(5x + 3)$	t for S1. or B1 awarded. wing: east three terms have $x^2$ term) e following: )(2x + 1)
18. Sight of $(5x + 3)(2x - 1)$ or $2(5x + 3)(2x - 1)$ or equivalent (total area of both rectangles = $20x^2 + 2x - 6$ (cm <sup>2</sup> )	S1 B2	Intention to Allow $4 \times w$ May be imp Mark final a Allow $20x^2$ Award B1 f $20x^2$ Award B1 f $20x^2$ If no marks $40x^2$ $40x^2$ $20x^2$	or equivalent is $\overline{p(2 \times)}$ width $\times$ length of plied in later we answer for B2. + 2x + -6 for for sight of one $x^2 + 12x - 10x$ t of the four co $x^2 + 6x - 5x - 3$ $10x^2 + x - 3)$ $x^2 + 4x - 12$ . S, award SC1 for $x^2 + 24x - 20x$ $x^2 - 2x - 6$ from	length. or equivalen orking if B2 B2. e of the follow – 6 with at I prrect (must I 3 or one of the – 12. om $2(5x + 3)$ n 2(5x - 3)(2)	t for S1. or B1 awarded. wing: east three terms have $x^2$ term) e following: 2x + 1
18. Sight of $(5x + 3)(2x - 1)$ or $2(5x + 3)(2x - 1)$ or equivalent (total area of both rectangles = $20x^2 + 2x - 6$ (cm <sup>2</sup> )	S1 B2	Intention to Allow $4 \times v$ May be imp Mark final a Allow $20x^2$ Award B1 f 20. 00 00 00 00 00 00 00 00 00 00 00 00 0	or equivalent is $\overline{p(2 \times)}$ width $\times$ width $\times$ length of plied in later we answer for B2. + 2x + -6 for for sight of one $x^2 + 12x - 10x$ t of the four co $x^2 + 6x - 5x - 3$ $x^2 + 6x - 5x - 3$ $x^2 + 4x - 3$ $x^2 + 4x - 12$ . S, award SC1 for $x^2 + 24x - 20x$ $x^2 - 2x - 6$ from $x^2 - 22x + 6$ from $x^2 - 22x + 6$ from	length. or equivalen orking if B2 B2. e of the follow – 6 with at l brrect (must l 3 or one of the – 12. om $2(5x + 3)$ n 2(5x - 3)(2) om $2(5x - 3)$	t for S1. or B1 awarded. wing: east three terms have $x^2$ term) e following: 2x + 1 2x + 1 2x - 1.

10			Chook diagram for	opowor	
Mothod using angle XX	7		Check diagram for	answer.	
$\frac{1000 \text{ using angle } 12}{\sqrt{7} - 18.6 \text{ or } 18}$	E x sin 50, or oquivalant	MO	Award M1 for one	of the following	
12 = 10.0  10	oin 40	IVIZ			
lan 40( )	511 40		• $\tan 40(^{\circ}) =$	= <u>18·0</u> VZ	
			· V7 10		
			• $\underline{YZ} = \underline{18}$	or equivalent	
				40	
	= 22(·166)(cm)	A1	Accept an answer rounded or truncated.		ated.
			Award M2A0 for a	ny of the followin	a unsunnorted
			answers:		gansapponea
			Method	Radians	Gradians
			18.6	rtadiario	
			tan 40	-16·648	25·600
					II
19. <u>Alternative using angle</u>	YXZ				
YZ	Z = 18·6 × tan 50(°)	M2	Award M1 for tan	$50(^\circ) = \underline{YZ}$	
				18.6	
	22(400)	A 4	Accord on anous		atad
	= 22(.166)(Cm)	A1	Accept an answer	rounded or trund	ated
			Aurord MOAD for a	nu of the followin	aa
			Award MZAU IOF a	ny oi the iollowin	g unsupported
			answers.		
			Method	Radians	Gradians
			10.6 top 50	F 057	10.0
			18.6 × tan 50	-5.057	18.0
19. <u>Alternative method</u>					-
<b>Correct</b> use of a 'tw	vo-step' method.	M2	A partial trigonome	etric method is M	0.
			A		
22	2(·166)(CM) ISW	A1	Accept an answer	rounded or trunc	ated.
20					
Working in mm	Working in cm				
		M1	Allow 60 < 'their 60	0∙5' ≤ 61.	
60·5 × 7	6-05 × 7		Allow 6 cm < 'their	<sup>•</sup> 6•05' cm ≤ 6•1 c	m.
OR	OR				
$420 \pm 0.5 \times 7$	$42 + 0.05 \times 7$				
	400 E (man) 10\A/	Δ1	Allow 42.35 cm pi	rovided units are	given and correct
	423-5 (mm) ISVV				given and correct.
			If no marks, award	SC1 for sight of	60·5 OR 6·05.

21 Midpoints 25 35 45 (55) 65 75	B1	May be implied in later working (i.e. the correct
21. Mildpoints 23, 33, 43, (33), 03, 73	ы	products).
Missing 10 for 50 <u>&lt;</u> <i>t</i> < 60	B1	······
25x2 + 35x8 + 45x4 + 55x <b>10</b> + 65x3 + 75x5 (= 50 + 280 + 180 + <b>550</b> + 195 + 375 = 1630)	M1	FT 'their 10' provided $\neq$ 0 or 1. Allow with consistent incorrect midpoints provided at least 5 within the correct interval including 'bounds' Allow use of <i>a</i> instead of 10 (sight of 1080 + 55a).
÷ 32	m1	FT 22 + 'their $a$ ' (a $\neq$ 0). Allow use of $a$ instead of 10.
50.9(375) or 51 or equivalent	A1	CAO. Must be derived from correct working.
		If no marks or first B1 only, award SC1 for one of the following: • (1080 ÷ 22 = ) 49(·09) from use of $a = 0$ • (1080 ÷ 32 = ) 33·7(5) or 34 from use of $a = 0$ • (1135 ÷ 23 = ) 49(·3) from use of $a = 1$ • (1135 ÷ 32 = ) 35(·46875) from use of $a = 1$ . Award B1 B0 M1 m1 A0 for $\frac{1080 + 55a}{22 + a}$ or $\frac{1080 + 55a}{32}$ or equivalent expression involving $a$ .
22. Sight of $12x + 4y = 180$ or equivalent AND $26x + 7y = 360$ or equivalent	B2	x and y terms need to be collected for B2. If B2 not awarded, award B1 for one of the following: • $12x + 4y = 180$ or equivalent • $13x + 5x + 8x + 7y = 360$ • $26x + 7y = 360$ or equivalent
Method to eliminate one variable e.g. equal coefficients <b>AND</b> <u>appropriate intention to</u> add or subtract or use a method of substitution.	M1	FT 'their equations', provided of equivalent difficulty. Allow one error in one term (not the term with equal coefficients).
First variable found $x = 9(^{\circ})$ or $y = 18(^{\circ})$	A1	CAO (for their equations).
Substitute to find the 2 <sup>nd</sup> variable.	m1	FT substitution of their '1 <sup>st</sup> variable' if M1 gained.
Second variable found.	A1	No marks for 'trial and improvement'. No marks for an unsupported answer.