

REVISE

.wales

2.12 – Linear sequences & nth term

Mark schemes for the 2.12 question pack

Spec 2.3.1, 2.3.2, 2.3.3, 2.3.4 – Unit 2

SOLUTIONS · 2025 SPECIFICATION

Mark schemes for the 10 questions in the corresponding revise.wales question pack (29 marks total). Sources: legacy WJEC GCSE papers, WJEC SAM, and custom-authored mark schemes. Pack layout © revise.wales.

2.	8	11	16		B2	B1 for two correct OR for 7. 8. 11. OR for 11. 16. 23.
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<p>6(a) $2x + 2y = 7y - 3$ OR $x + y = \frac{7y - 3}{2}$</p> <p>$2x = 5y - 3$ OR $x = \frac{7y - 3}{2} - y$</p> <p>$x = \frac{5y - 3}{2}$</p>	<p>B1</p> <p>B1</p> <p>B1</p>	<p>F.T. until 2nd error provided of equivalent difficulty.</p> <p>Accept $x = \frac{5y - 3}{2}$ OR $x = \frac{-5y + 3}{-2}$ OR $x = 2\frac{1}{2}y - 1\frac{1}{2}$ or equivalent. Must have 'x ='. An answer of $\frac{5y - 3}{2}$ gains B1B1B0 (missing 'x =')</p> <p>Mark final answer.</p>
<p>6.(b) $n^2 + 2$</p>	<p>B2</p>	<p>Mark final answer. B1 for $n^2 \pm \dots$, not for n^2 alone B0 for $an^2 \pm \dots$ where $a \neq 1$.</p>
<p>7</p> <p>$QS = \frac{8}{\sin 38}$</p> <p>$= 13 \text{ or } 12.99(\dots)$</p> <p>$\tan x = \frac{15}{12.99(\dots)}$</p> <p>$x = \tan^{-1}(15/12.99\dots)$ $= 49(.098\dots)^\circ$</p>	<p>M2</p> <p>A1</p> <p>M1</p> <p>m1</p> <p>A1</p>	<p>M1 for $\frac{8}{\sin 38} = \sin 38$. Accept M1 for $QS = \frac{8}{\sin 90 \sin 38}$ M2 for $QS = \frac{8 \times \sin 90}{\sin 38}$</p> <p>F.T. 'their 12.99(...)', stated or shown on diagram.</p> <p>Mark final answer. If FT leads to a non-integer value, allow to the nearest degree.</p>

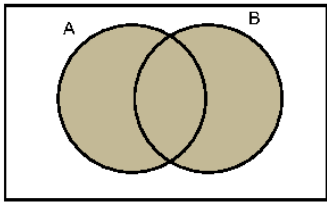
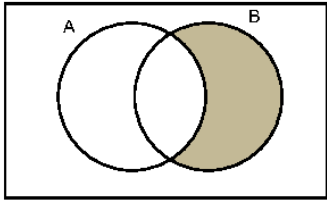
WJEC GCSE MATHEMATICS
SUMMER 2019 MARK SCHEME

GCSE MATHEMATICS Unit 2 : Higher Tier	Mark	Comments
1.(a) $3n + 5$ or equivalent	B2	B1 for sight of $3n$. B0 for $-3n$ Mark final answer.
1.(b) $3t = r + 8$ or $r + 8 = 3t$ or $-3t = -r - 8$ $t = \frac{r+8}{3}$ or $\frac{r+8}{3} = t$ or $t = \frac{-r-8}{-3}$	B1 B1	F.T. only from $3t = \pm r \pm 8$, stated or implied. ($3t = r + 8$ will have already gained the previous B1.) B1B0 for $-t = \frac{-r-8}{3}$ or equivalent. Mark final answer. <u>Note</u> Allow B1B0 for $t = (r + 8) \div 3$ with or without brackets. Allow B1B0 for $\frac{r+8}{3}$ ('t' missing)
1.(c) $6x + 4 = 46$ OR $3x + 2 = 23$ $6x = 42$ OR $3x = 21$ $(x =) 7$	B2 B1 B1	B1 for $(x + 5) + (2x - 3) + (x + 5) + (2x - 3) = 46$ or equivalent e.g. $(x + 5) + (2x - 3) = 23$ B1 FT collection of 'their terms' if of equivalent difficulty. (linear equation only.) B1 FT <u>only</u> from $ax = b$. Allow a fraction from a FT value unless x is a whole number. $(x =) 7$ gains all four marks. Each B mark implies all previous B marks. Mark final answer.
1.(c) <u>Alternative method</u> A trial showing correct values and understanding of perimeter. (e.g. $2(4 + 5) + 2(2 \times 4 - 3) = 28$) An <u>improved</u> trial. $(x =) 7$	B1 B1 B2	Consistent use of x AND correct evaluation. B1 Dependent on first B1. If 1 st trial is using '7' award B1B1 followed by B1 if left embedded but B2 if shown as $x = 7$. B2 B1 for an implied / embedded ' $x = 7$ ' but not shown as $x = 7$. $(x =) 7$ gains all four marks. Mark final answer.

WJEC GCSE MATHEMATICS
AUTUMN 2019 MARK SCHEME

GCSE MATHEMATICS Unit 1: Higher Tier	Mark	Comments
1.(a) (Number of sides =) $\frac{360}{36}$ $= 10$	M1 A1	
1.(b) $(180 - 36) \times 10$ or equivalent $= 1440(^{\circ})$	M1 A1	F.T. 'their number of sides' if >2.
<u>Alternative method.</u> $(10 - 2) \times 180$ or equivalent $= 1440(^{\circ})$	M1 A1	F.T. 'their number of sides' if >2.
2.(a) Reflection in (the line) $x = -2$	B2	B1 for 'reflection' or 'reflected'. B1 for sight of ' $x = -2$ ' or equivalent e.g. $x + 2 = 0$ (written , not simply drawn).
2.(b) (i) Correct translation.	B2	B1 for translation '5 right'. B1 for translation '6 down'. SC1 for 2 correct vertices.
2.(b) (ii) $\begin{pmatrix} -5 \\ 6 \end{pmatrix}$	B1	B0 for -5 (missing brackets) OR $\begin{pmatrix} -5,6 \\ 6 \end{pmatrix}$ B0 for $-\frac{5}{6}$ with or without brackets. No FT from part (b)(i).
3.(a) -5 -2 3	B2	B1 for two correct (in correct position) OR B1 for -6, -5, -2
3.(b) $6n - 1$ or equivalent	B2	B1 for sight of 6n. Mark final answer.
4.(a) 3^4	B1	
4.(b) 40·84101	B1	
4.(c) 3·6	B1	
5.(a) Correct construction of $\angle PQR = 60^{\circ}$. Correct triangle PQR drawn.	M1 A1	Correct construction arcs must be seen and angle drawn. PQ = 7 cm (± 2 mm) and triangle drawn. Allow non labelling of point P (unless position contradicted). Ignore extension of line QP if correct triangle drawn.
5.(b) Arc, <u>centre A</u> , intersecting LM at two points AND Intersecting arcs (equal radii) using the above two points as centres. Line drawn	M1 A1	[Note to markers: These arcs may be identified by the fact that they will 'cross the line LM at an acute angle'. Arcs 'crossing the line at 90° ' is evidence of an inappropriate method.]
<u>Alternative method.</u> Using the properties of a kite. Intersecting arcs whose centres are any two points on the line LM and respective radii equal in length to the distance from the points to the point A. Line drawn.	M1 A1	[Note to markers: The arcs will always intersect at a point that is a 'reflection of point A' in the line LM.]

WJEC GCSE MATHEMATICS
AUTUMN 2020 MARK SCHEME

GCSE Mathematics Unit 1: Higher Tier	Mark	Comments
1.(a) $5n - 3$	B2	B1 for sight of $5n$. Mark final answer.
1.(b) 17	B1	
1.(c) $2n + 2$ OR $2(n + 1)$	B2	If $2n + 2$ is not their final answer allow B1 for sight of $2n + 2$ in earlier work. B1 for a correct answer not simplified or incorrectly simplified e.g. $n + n + 2$.
2.(a)(i) ε 	B1	
2.(a)(ii) ε 	B1	
2.(b) A valid statement. e.g. 'all multiples of 6 are also multiples of 3' 'because 3 goes into 6', '6 is a multiple of 3', '3 is a factor of 6'.	E1	Allow e.g. '(set) C is a subset of (set) A'. 'it is a multiple of 3' '6, 12, ... are also multiples of 3'.
3.(a) 9 -7	B2	B1 for each.
3.(b) At least 6 correct plots and no incorrect plot. A smooth curve drawn through their plots.	P1 C1	FT 'their (-2,9)' and 'their (2,-7)' Allow \pm '1/2 a small square'. FT 'their 8 plots'. OR a curve through the 6 given points and (-2,9) and (2,-7). Allow intention to pass through their plots. (\pm 1 small square horizontal or vertical.)
3.(c) Line $y = 1$ drawn -0.8 AND 4.8	B1 B1	Must be at least 2cm long. FT intersection of 'their curve' with 'their $y = 1$ ' only if exactly two points of intersection and $y \neq 0$. If curve drawn, but no line drawn, allow a FT from intersection of 'their curve' with the line $y = 1$ only if exactly two points of intersection for B0 B1. Allow \pm '1 small square'.

10.(a)(i) Correct reason given. e.g. 'An angle at the circumference subtended by a diameter is a right angle'. 'line AC is a diameter'	E1	Accept any correct unambiguous wording. The key word is 'diameter'. Allow eg 'angle in a semicircle is 90°', 'line AC goes through the centre', 'opposite a diameter' Do not accept 'because it's a right angle'.
10.(a)(ii) $\tan x = \frac{7.5}{4.7}$ $x = \tan^{-1}(7.5 / 4.7)$ or $\tan^{-1} 1.6$ or $\tan^{-1} 1.59(\dots)$ $= 57.9(\dots)^\circ$ or $57.8(\dots)^\circ$ or 58°	M1 m1 A1	Implies M1. C.A.O. <u>Alternative method to find x</u> A correct and complete method (using Pythagoras's theorem and a trigonometric relationship). M2 $x = 57.9(\dots)^\circ$ or $57.8(\dots)^\circ$ or 58° CAO A1
10.(b) $(y =) 58^\circ$ Correct circle theorem given. e.g. 'angles (at the circumference) subtended by the same chord (or arc) are equal', 'angles in the same segment (are equal)'.	B1 E1	<u>Strict</u> FT of 'their x'. Accept any correct unambiguous wording. Allow eg 'angles on the same chord (are equal)' Do not accept e.g. 'they are equal' on its own.
11. 2^{400}	B2	B1 for $(2^{100})^4$ OR sight of 2^4
12. (Height =) $\frac{3 \times 5533}{825}$ OR $\frac{5533}{\frac{1}{3} \times 825}$ $= 20.1(2 \text{ cm})$ ----- <i>Alternative method (finding the radius first):</i> Use $A = \pi r^2$ to evaluate r or r^2 . (Height =) $\frac{3 \times 5533}{\pi \times 16.2(05\dots)^2}$ OR $\frac{5533}{\frac{1}{3} \times \pi \times 16.2(05\dots)^2}$ OR $\frac{3 \times 5533}{\pi \times 262.6(\dots)}$ OR $\frac{5533}{\frac{1}{3} \times \pi \times 262.6(\dots)}$ $= 20.1(2\dots \text{ cm})$	M2 A1 M2 A1	M1 for $5533 = 1/3 \times \text{height} \times 825$ or equivalent. Allow an answer of 20(cm) from correct working. Allow use of $\pi = 3.14, 3.142$ or $3.14(59\dots)$. When using the π button on the calculator, $r = 16.2(05\dots)$ OR $r^2 = 262.6(\dots)$. There will be no FT for any radius other than $r = 16\text{cm}$, from working seen. M1 for $5533 = 1/3 \times \text{height} \times \pi \times 16.2(05\dots)^2$ or equivalent. Allow M1 for use of $r = 16$ (cm) Allow an answer of 20(cm) from correct working. Accept an answer in the range 20.10 to 20.143(cm) <u>FT base radius = 16 cm</u> : Allow an answer in the range 20.6(cm) to 20.65(cm) OR 21(cm) from correct working.
13.(a) $(2x + 9)(2x - 9)$	B2	B1 for $(2x \dots 9)(2x \dots 9)$
13.(b) $(7x - 4)(x + 2)$	B2	B1 for $(7x \dots 4)(x \dots 2)$
13.(c) $(x + 2)^2(x + 7)$ OR $(x + 2)(x + 2)(x + 7)$	B2	B1 for $(x + 2)^2(x + 2 + 5)$ OR $(x + 2)[(x + 2)^2 + 5(x + 2)]$ OR $(x + 7)(x^2 + 4x + 4)$ OR $(x + 2)(x^2 + 9x + 14)$. Allow B1 for $(x + 2)^2(x + k)$ where $k \neq 0, 2$ or 7 .
14. $-\frac{1}{2}$ or equivalent	B2	B1 for -2 or $\frac{1}{2}$.
15. $2n^2 + 1$ or equivalent $= 20001$	B2 B1	B1 for sight of $2n^2$ OR for sight of consistent 2 nd difference 4. FT from their $2n^2 \pm k$, where $k \neq 0$ OR from their $2n^2 \pm an$, where $a \neq 0$ OR from their $2n^2 \pm an \pm k$, where $a \neq 0, k \neq 0$. An unsupported answer of 20001 gains all 3 marks. If no marks, award SC1 for an unsupported answer of 20000.

3.(a)(i) m^7	B1	
3.(a)(ii) m^{10}	B1	
3.(b) $7n - 3$	B2	Mark final answer. B1 for sight of $7n$. Allow notation of $n7$ or $7 \times n$ or $n \times 7$ for $7n$. Allow N for n , but penalise -1 for use of a different letter.

7, 8 and 9

B2 Award B2 for all three integers and no extras.

Award B1 for one of the following indicated as a final answer:

- 7, 8, 9 and only one other incorrect value
- for two correct with no incorrect value
- 7 to 9
- 7, 7·5, 8, 8·5, 9
- sight of $6.5 < n < 9.5$ or equivalent
- 14,16,18
- 14,15,16,17,18.

Allow B2 for correct embedded answers of 7, 8 and 9 (e.g. sight of only $2 \times 7 = 14$, $2 \times 8 = 16$, $2 \times 9 = 18$ with no other calculations) BUT only B1 if contradicted on answer line (e.g. 14, 16, 18 for the example above).

3. (a) $4n + 7$ or equivalent	B2	Mark final answer. Award B1 for sight of $4n$. Award B0 for $-4n$.
3. (b) $-4, -1, 4$	B2	Answer space takes precedence. Award B1 for one of the following: <ul style="list-style-type: none">• two correct• $-5, -4, -1$• $-1, 4, 11$

$x = 2.72$ with $x = -0.63$ (answers to 2dp)	...	OR for their quadratic equation.
16. (nth term $\Rightarrow 3n^2 - 1$ or equivalent)	B2	B1 for sight of $3n^2$ OR $6n^2/2$. Sight of 2 nd difference 6 is insufficient for B1.
(250 th term $\Rightarrow 187499$)	B1	FT from their $3n^2 \pm k$, where $k \neq 0$ OR from their $3n^2 \pm an$, where $a \neq 0$ OR from their $3n^2 \pm an \pm k$, where $a \neq 0$, $k \neq 0$.

8. $n^2 + 3$ or equivalent.	π B2 2	B1 for $n^2 \pm \dots$ (not for n^2).
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End of solutions