REVISE
.wales

3.06 — Quadratic sequences & nth term

Mark schemes for the 3.06 question pack

Spec 2.3.5 — Unit 2

SOLUTIONS · 2025 SPECIFICATION

Mark schemes for the 7 questions in the corresponding revise.wales question pack (15 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.

6(a) $2x + 2y = 7y - 3$ OR $x + y = \frac{7y-3}{2}$	B1	F.T. until 2nd error provided of equivalent difficulty.
$2x = 5y - 3$ OR $x = \frac{7y-3}{2} - y$	B1	
$x = \frac{5y-3}{2}$	B1	Accept x= $\frac{5y}{2} - \frac{3}{2}$ OR x = $\frac{-5y+3}{-2}$ OR x = 2½y − 1½ or equivalent. Must have 'x = '. An answer of $\frac{5y-3}{2}$ gains B1B1B0 (missing 'x =') Mark final answer.
6.(b) $n^2 + 2$	B2	Mark final answer. B1 for $n^2 \pm$ ...., not for n^2 alone B0 for $an^2 \pm$ ..... where $a \neq 1$.
7 $QS = \frac{8}{\sin 38}$	M2	M1 for $\frac{8}{QS} = \sin 38$. Accept M1 for $\frac{QS}{\sin 90} = \frac{8}{\sin 38}$ M2 for $QS = \frac{8 \times \sin 90}{\sin 38}$
$= 13$ or $12{\cdot}99(..)$	A1	
$\tan x = \frac{15}{12.99(..)}$	M1	F.T. 'their 12.99(..)', stated or shown on diagram.
$x = \tan^{-1}(15/12{\cdot}99\ldots)$	m1	
$= 49(\cdot 098..°)$	A1	Mark final answer. If FT leads to a non-integer value, allow to the nearest degree.

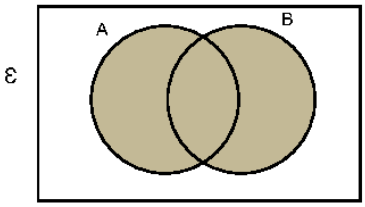
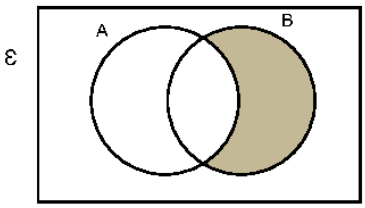
WJEC GCSE MATHEMATICS

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 $= 1440(°)$	M1 A1	F.T. 'their number of sides' if >2.
Alternative method. *$(10 - 2) \times 180$ or equivalent* *$= 1440(°)$*	*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 $(-5,6)$ 6 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 PQR = 60°. Correct triangle PQR drawn.	M1 A1	Correct construction arcs must be seen and angle drawn. PQ = 7 cm (±2mm) and triangle drawn. Allow non labelling of point P (unless position contradicted). Ignore extension of line QP if correct triangle drawn.
5.(b) Arc, centre A, 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.]
Alternative method. *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) 	B1	
2.(a)(ii) 	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 ± '½ 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. (± 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 ± '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) $\tan x = \frac{7{\cdot}5}{4{\cdot}7}$ $x = \tan^{-1}(7{\cdot}5 / 4{\cdot}7)$ or $\tan^{-1} 1.6$ or $\tan^{-1} 1.59(\ldots)$ $= 57{\cdot}9(\ldots)(°)$ or $57{\cdot}8(\ldots)(°)$ or $58(°)$	M1 m1 A1	 Implies M1. C.A.O. *Alternative method to find x* *A correct and complete method (using Pythagoras's theorem and a trigonometric relationship). M2* *x = 57·9(…)(°) or 57·8(…)(°) or 58(°) CAO A1*
10.(b) (y =) 58(°) 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	Strict 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 =) $\frac{3\times5533}{825}$ OR $\frac{5533}{\frac{1}{3}\times825}$ = 20·1(2 cm)	M2 A1	M1 for $5533 = 1/3 \times$ height $\times 825$ or equivalent. Allow an answer of 20(cm) from correct working.
Alternative method (finding the radius first): *Use $A = \pi r^2$ to evaluate r or r^2.* *(Height =)* $\frac{3\times5533}{\pi\times16.2(05\ldots)^2}$ *OR* $\frac{5533}{\frac{1}{3}\times\pi\times16.2(05\ldots)^2}$ *OR* $\frac{3\times5533}{\pi\times262.6(\ldots)}$ *OR* $\frac{5533}{\frac{1}{3}\times\pi\times262.6(\ldots)}$ *= 20·1(2… cm)*	 *M2* *A1*	*Allow use of π = 3·14, 3·142 or 3·14(59…).* *When using the π button on the calculator,* *r = 16·2(05…) OR r^2 = 262·6(…).* *There will be no FT for any radius other than r = 16cm, from working seen.* *M1 for* $5533 = 1/3 \times$ *height* $\times \pi \times 16.2(05\ldots)^2$ *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)* *FT base radius = 16 cm: 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 $(2x \ldots 9)(2x \ldots 9)$
13.(b) $(7x-4)(x+2)$	B2	B1 for $(7x \ldots 4)(x \ldots 2)$
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. $-½$ or equivalent	B2	B1 for -2 or ½.
15. $2n^2+1$ or equivalent = 20 001	B2 B1	B1 for sight of $2n^2$ OR for sight of consistent 2nd 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 20 001 gains all 3 marks. If no marks, award SC1 for an unsupported answer of 20 000.

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: • two correct • −5, −4, −1 • −1, 4, 11

$x = 2{\cdot}72$ with $x = -0{\cdot}63$ (answers to 2dp)		A1	CAO for their quadratic equation.
16.	(nth term =) $3n^2 - 1$ or equivalent	B2	B1 for sight of $3n^2$ OR $6n^2/2$. Sight of 2nd difference 6 is insufficient for B1.
	(250th term =) 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 $a \neq 0$, $k \neq 0$.

End of solutions