REVISE
.wales

2.25 — Quadratic equations by factorisation

Mark schemes for the 2.25 question pack

Spec 2.2.5 — Unit 2

SOLUTIONS · 2025 SPECIFICATION

Mark schemes for the 4 questions in the corresponding revise.wales question pack (14 marks total). Sources: legacy WJEC GCSE papers, WJEC SAM, and custom-authored mark schemes. Pack layout © revise.wales.

14. (a) $2x^2 + x + 1 = 7$ OR $x^2 + x^2 + x + 1 = 7$ leading to $2x^2 + x - 6 = 0$		B1	Must be seen. Accept 1(x +1) for x + 1.
14.(b) $(2x - 3)(x + 2)$ (=0)	✓✓	B2	B1 for (2x …. 3)(x ….. 2)
(Length of each side =) 1·5 (metres)	✓	B1	F.T. from 'their two brackets'. (If both F.T. solutions are of the same sign, then both are required for this B1.) Ignore presence of x = –2. *Using quadratic formula.* *(x =) $\frac{-1\pm\sqrt{[1^2 - 4(2)(-6)]}}{2(2)}$ M1* *Allow one error, in sign or substitution, but not in the formula.* *= $\frac{-1\pm\sqrt{49}}{4}$ A1* *x = 1·5 (metres) [ignore x = -2] A1* *Using trial and improvement* *Award B3 for a method leading to both solutions, namely x = 1·5 and x = -2, otherwise B0.*
Statement about ignoring x = – 2 as would be a negative length.	✓	E1	F.T provided one solution is positive and the other is negative.

15.(b)	$\sin 340$		B1	
16.	$3x(x-3) + x(x-1) \quad (= 50)$	✓	M1	Must be seen. Allow $3x(2x-4) - 2x(x-1)$ for M1
	$4x^2 - 10x = 50$	✓	m1	Must be seen.
	$2x^2 - 5x - 25 = 0$	✓	A1	Convincing.
	$(2x + 5)(x - 5)$ [= 0]	✓✓	B2	B1 for $(2x \ldots 5)(x \ldots 5)$ [= 0]
	$x = 5$	✓	B1	Strict F.T. only if one +ve value and one –ve value possible. B0 if negative value **not** discarded. *Using formula* *$(5 \pm 15) / 4$ B2 (B1 for correct intent with 1 slip.)* *$x = 5$ B1 (B0 if −2·5 not discarded.)* *Using trial and improvement* *Award B2 for a method leading to both solutions, namely $x = 5$ and $x = -2{\cdot}5$ (with a further B1 for*

12. *(a)* (Total area =) $x^2 + (x + 3)^2$ or equivalent	B1	Allow award of B1 if brackets are omitted
$x^2 + x^2 + 3x + 3x + 9$	M1	
$2x^2 + 6x + 9 = 22.5$	A1	F.T. for equivalent difficulty i.e. from $x^2 + (ax + b)^2$ with a,b ≠ 0.
$4x^2 + 12x - 27 = 0$	A1	Equating to zero and doubling. Must be convincing.
12. *(b)* $(2x - 3)(2x + 9) = 0$	B2	B1 for $(2x \ldots 3)(2x \ldots 9)$
$x = 3/2$ [or $x = -9/2$]	B1	FT from 'their two brackets'. (If both F.T. solutions are of the same sign, then both are required for this B1.) Ignore presence or absence of x = –9/2. *Alternative method (using quadratic formula):* $x = [-12 \pm \sqrt{(12^2 - 4 \times 4 \times -27)}] / (2 \times 4)$ *Allow one error, in sign or substitution, but not in the formula.* *M1* $x = [-12 \pm \sqrt{576}] / 8$ *C.A.O.* *A1* $x = 3/2$ [or $x = -9/2$] *C.A.O.* *A1*
(Dimensions are) 3/2 (cm) and (3/2 + 3 =) 9/2 (cm)	B1	F.T. 'their derived x'.
Explanation that x cannot be – 9/2 (cm) because a length cannot be negative (or must be positive).	E1	F.T. provided one solution is positive and the other is negative.

6.(a) 0·3 shown for 'Does not visit '*Erddig Gardens*'. Use of 0·7 × …… = 0·28 P(goes to '*Bersham Heritage Centre*') = 0.4 Second set of branches 0·4, 0·6, 0·4, 0·6	B1 M1 A1 A1	 Implied by sight of 0·4 (on 'top branch' of the four on the right) F.T. 'their 0·4' BUT **dependent** on M1 gained. (i.e. M0A0A0 for 0·28 and 0·72 on branches.)
6.(b) 0·7 × 0·6 = 0·42 ISW	M1 A1	F.T. 0·7 × 'their 0·6' only if 0 < 'their 0·6' < 1 0·42 gains M1A1.
7. (area) Volume Length Volume None Area	B3	*Must use the terminology given in the question.* B3 for all 5 correct. B2 for 3 or 4 correct. B1 for 2 correct. B0 otherwise.
8.(a) $(x + 7)(x - 3)$ $(x =) -7$ AND $(x =) 3$	B2 B1	B1 for $(x \ldots 7)(x \ldots 3)$. Strict F.T. from their brackets. Allow the following. B2 for x + 7 (=0) AND x − 3 (=0) (B1) (x =) −7 AND (x =) 3 (B1) B1 for x − 7 (=0) AND x + 3 (=0) (B0) (x =) 7 AND (x =) −3 (B1) FT B1 if only (x =) −7 AND (x =) 3 seen. (B1)
8.(b) Correct method for clearing all three fractions. Accurate clearing of fractions AND expansion of brackets on lhs. 24x = 36 or equivalent. x = 36/24 or equivalent	M1 A1 A1 A1	FT until 2nd error. May be seen in stages. Allow if all over a common denominator. May be seen in stages For collection of terms. FT from 'their ax = b' ONLY if M1 gained AND no more than one previous error. If no marks, allow SC1 for sight of 2(2x – 3) + 5(4x + 5) or equivalent. (10) If FT answer is a whole number then it must be shown as an integer. Allow a correct embedded answer of 1·5 or 1½ BUT penalise −1 if followed by x ≠ 1·5 or 1½. Note : An answer of 1·5 that is found without gaining M1 OR that is not embedded is zero marks.
9.(a) 40·5	B1	
9.(b) (25·5 + 25·5 =) 51	B1	
9.(c) (11·5 + 11·5=) 23	B1	