REVISE

.wales

F2.13 — Drawing quadratic graphs ($y = ax^2 + bx + c$)

Mark schemes for the F2.13 question pack

Spec 2.4.4 — Unit 2

SOLUTIONS · 2025 SPECIFICATION

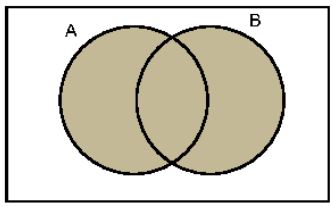
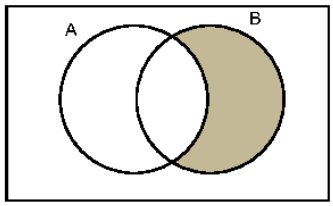
Mark schemes for the 6 questions in the corresponding revise.wales question pack (22 marks total). Sources: legacy WJEC GCSE papers, WJEC SAM, and custom-authored mark schemes.

8.(b) (iii) 5·4		B1	
9.			*Answers /working may be seen on diagram.*
(Use of area of PBCQ =) $52 - 20$ (= 32 cm^2)	✓	B1	
(Area of PBCQ =) $8 \times f = 32$	✓	M1	F.T. 'their derived 32' but not 52 [B1M1 implied by 8f = 32]
$f = 4$	✓	A1	C.A.O. (implies B1M1A1)
(Area of APQD =) $4 \times g = 20$	✓	M1	F.T. 'their f'.
$g = 5$	✓	A1	
			Alternative method *$f \times (g + 8) = 52$* *M1* *[$fg + 8f = 52$]* *$fg = 20$* *M1* *[M2 implied by $20 + 8f = 52$ or $8f = 32$]* *$f = 4$* *A1 C.A.O.* *$4 \times g = 20$* *M1 FT 'their f'.* *$g = 5$* *A1*
	✓	OC1	Organisation and Communication. For OC1, candidates will be expected to: • present their response in a structured way • explain to the reader what they are doing at each step of their response • lay out their explanation and working in a way that is clear and logical
	✓	W1	Accuracy of writing. For W1, candidates will be expected to: • show all their working • make few, if any, errors in spelling, punctuation and grammar • use correct mathematical form in their working • use appropriate terminology, units, etc

12.(a) −5 11	B2	B1 for each. Table takes precedence if conflicting values given.
12.(b) At least 6 correct plots and no incorrect plot.	P1	F.T. 'their (−2,−5)' and 'their (2,11)' OR (−2,−5) and (2,11) plotted. Allow ± '½ a small square'. Ignore any plots that can not be shown e.g. (−2,−13).
A smooth curve drawn through their plots.	C1	F.T. 'their plots'. OR a curve through the 6 given points and (−2,–5) and (2,11). Allow intention to pass through their plots. (± 1 small square horizontal or vertical.)
12.(c) Line y = 2 drawn	L1	Must be at least 2cm long.
−4·65 AND 0·65	B1	F.T. intersection of 'their curve' with 'their $y = 2$' only if exactly two points of intersection. Allow ± '1 small square'.

10.(a) For a method that produces 2 prime factors from the set {3, 3, 5, 7} before the 2nd error.	M1	
3, 3, 5, 7	A1	C.A.O. For sight of the four correct factors (Ignore 1s)
$3^2 \times 5 \times 7$	B1	F.T. 'their primes' provided at least one index form used with at least a square. Allow $(3^2)(5)(7)$ and $3^2.5.7$ Inclusion of 1 as a factor gets B0.
10.(b) 42 = 2 × 3 × 7 or equivalent correct strategy.	M1	M1 for sight of 2, 3, 7 'together'. (Not for 2x21, 3x14 and 6x7.) (Not for just listing all factors 1,2,3,6,7,14,21.)
(HCF =) 21	A1	M1A0 for 3 × 7. FT 'their answer to 10(a)' only if of equivalent difficulty (at least two common prime factors).
11. −13	B1	
Scale on y-axis '2cm square ≡ 10 units'.	B1	
At least 7 correct plots and no incorrect plots.	P1	F.T. 'their (−2,−13)' AND 'their uniform scale' if possible. Allow ± '½ a small square'.
A smooth curve drawn through their plots.	C1	F.T. 'their 8 plots'. (Only if an uniform scale used.) OR a curve through the 7 given plots and (-2,-13). Allow intention to pass through their plots (within 1 small square, either horizontally **or** vertically of the point).
12.		*Answers/working may be seen on diagram.*
(Angle AÔB or exterior angle =) $\frac{360(°)}{8}$	M1	
$= 45(°)$	A1	Sight of 45 (even e.g. OÂB = 45) gains M1A1.
(OÂB =) $\frac{180 - 45}{2}$	M1	FT 'their 45' (but not 60°).
$= 67{\cdot}5(°)$	A1	
12. Alternative method 1		
(Sum of interior angles =) (8 – 2)×180° or equivalent	*M1*	
= 1080(°)	*A1*	*(Interior angle =) 135(°) implies M1A1*
(OÂB =) ½ × (1080 ÷ 8) or equivalent	*M1*	*FT 'their interior angle sum' (≠ 1440)*
= 67·5(°)	*A1*	
12. Alternative method 2		
(Using 16 right-angled triangles.)		
(Angle at O =) 360 / 16	*M1*	
= 22·5(°)	*A1*	
(OÂB =) 180 – 90 − 22·5	*M1*	*FT 'their 22·5'.*
= 67·5(°)	*A1*	

		Allow −1·7.
12.(a) −5	B1	
12.(b) At least 7 correct plots and no incorrect plot. A smooth curve drawn through their plots.	P1 C1	F.T. 'their (1,−5)' Allow ± '½ a small square'. F.T. 'their 8 plots'. OR a curve through the 7 given points and (1,−5) Allow intention to pass through their plots. (± 1 small square horizontal or vertical.)
12.(c)(i) Line y + x = 4 drawn.	B2	B1 for a straight line going through(0,4) or (4,0) BUT NOT line y = 4 nor line x = 4
12(c)(ii) −2·4 AND 3·4	B1	F.T. intersection of 'their curve' with 'their y + x = 4 ' (even for line y = 4) only if exactly two points of intersection. Must be seen to intersect their curve at two points. Allow ± '1 small square'

12.(a)(i) ε  	B1	
12.(a)(ii) ε  	B1	
12.(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'.
13. (One part =) (£)210 ÷ 3 = (£)70 (Total amount =) 14 × (£)70 OR (£)210 + 4 ×(£)70 + 7 × (£)70 = (£)980	M1 A1 m1 A1	 FT 'their (£)70' only if M1 gained. Allow m1 for sight of 210 AND 280 AND 490 together as the three shares. *For 210 ÷ 3 × 14 M3* *= 980 A1*
14.(a) 9 −7	B2	B1 for each.
14.(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.)
14.(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 ≠ 0. If curve drawn, but no line drawn, allow a FT from intersection of 'their curve' with line y = 1 only if exactly two points of intersection for B0B1. Allow ± '1 small square'.
15. 4 5 11 12 OR 4 6 10 12 OR 4 7 9 12	B3	May be written in any order. B1 for Range = 8. B1 for Median = 8. B1 for Total = 32. Penalise −1 **once only** for repeated values, negatives or fractional answers e.g. 4, 8, 8, 12 earns B1 B1 B1 −1 (2 marks), 8, 8, 8, 8 earns B0 B1 B1 −1 (1 mark).

11.(a) 0·27 or equivalent.	B2	Mark final answer. Allow ±0·27 OR (+)0.27 'and/or' –0.27. Award B1 for sight of one of the following: • 0·27 (or equivalent) followed by subsequent working • –0·27 • 0·0729.
11.(b) 8	B1	Answer line takes precedence. Allow embedded answer in working space provided not contradicted on answer line.
11.(c) 7	B1	Answer line takes precedence. Allow embedded answer in working space provided not contradicted on answer line.

End of solutions