REVISE
.wales

F3.02 — Maps, scale, bearings, plans & elevations

Mark schemes for the F3.02 question pack

Spec 3.3.1, 3.3.2, 3.3.3, 3.3.4, 3.3.5, 3.3.6, 3.3.7 — Unit 3

SOLUTIONS · 2025 SPECIFICATION

Mark schemes for the 11 questions in the corresponding revise.wales question pack (25 marks total). Sources: legacy WJEC GCSE papers, WJEC SAM, and custom-authored mark schemes. Pack layout © revise.wales.

14.(a)	8x − 6y or 2(4x – 3y)	B2	Must be in an expression for B2. B1 for sight of (+)8x or −6y. B1 for 8x + −6y Mark final answer.
14.(b)	2m = 19 m = 9½ or 19/2 or 9·5	B1 B1	FT from 2m = k. Accept m = k/2 (but, if on FT k is even, final answer must be given as a whole number.) B0 for '9 rem 1'. Mark final answer. Allow 2 marks for embedded answer BUT only 1 mark if contradicted by m ≠ 9½.
14.(c)	1	B2	B1 for sight of −20 or sight of (+) 21. But not – 20f (+) 21g. Mark final answer.

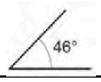
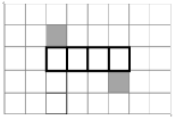
19.(a)	214°	B1	
19.(b) (i)	A	B1	
19.(b) (ii)	E	B1	

		Penalise -1 for incorrect notation, e.g. 445 out of 720.
7. Both points in correct position.	B4	*Tolerance of* ±2° *and* ± 2*mm* Allow 'end of line' to indicate position(s) of point(s) P. B3 for one point in correct position. B2 for one or two point(s) within 'distance' tolerance. B1 for one or two point(s) within 'angle' tolerance. If no marks gained allow SC1 for sight of 8 cm (≡) 400m OR 2cm (≡) 100m OR 1 cm (≡) 50m OR (scale ≡) 1 : 50

14.	3 AND 11	B2	Accept in any order. B1 for two numbers with a sum of 14 OR B1 for two numbers with a range of 8. Accept non-integers for B1 marks.

8. (Probability of Puffin Island=) 1 − 0·4 − 0·15 − 0·25 = 0·2	M1 A1	An unsupported answer of 0·56 implies M1
(Number of cards showing Puffin Island =) 0·2 × 80	M1	FT 'their stated P(Puffin Island)' × 80, only if 'their stated P(Puffin Island)' < 1.
= 16	A1	16/80 is M1A0 unless 16 has been seen.
Alternative method *(Number of cards showing other 3 islands =)* *0·4 × 80 + 0·15 × 80 + 0·25 × 80 or equivalent* *= 64*	*M1* *A1*	*Allow M1 for sight of 32 AND 12 AND 20.*
(Number of cards showing Puffin Island =) 80 – 64	*M1*	*FT 80 − 'their derived 64', only if 'their derived 64' < 80.*
= 16	*A1*	*16/80 is M1A0 unless 16 has been seen.*
8. OCW Organisation and Communication.	OC1	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 • write a conclusion that draws together their results and explains what their answer means
Accuracy of writing.	W1	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
9.(a) Correct construction method. e.g. (i) intersecting arcs of radii 6cm and 9cm with centres A and C respectively. OR (ii) copying the angle at B at the point A (will require AB or BA to be extended).	M1	Relevant construction arcs must be seen.
Completed parallelogram.	A1	
9.(b) 'measured length' × 200	M1	Allow for error in measuring line XY.
= 1520 (cm)	A1	Accept only in range 1480 to 1560 inclusive.
= 15·2 metres	B1	FT 'their 1520' ÷ 100. Unsupported 14·8 to 15·6 inclusive gains all 3 marks.
Alternative method *Sight of scale is 1cm represents 2m*	*B1*	
'measured length' × 2	*M1*	*Allow for error in measuring line XY.*
= 15·2 metres	*A1*	*Accept only in range 14.8 to 15.6 inclusive.*
10.(a) 9·231	B1	
10.(b) 170	B1	
10.(c) 10	B1	
11(a) 5n − 3	B2	B1 for sight of 5n. Mark final answer.
11.(b) 17	B1	
11.(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.

19.(a) Correct <u>construction</u> method. e.g. (i) intersecting arcs of radii 6cm and 9cm with centres A and C respectively. OR (ii) copying the angle at B at the point A (will require AB or BA to be extended). Completed parallelogram.	M1 A1	Relevant construction arcs must be seen.
19.(b) 'measured length' × 200 = 1520 (cm) = 15·2 metres	M1 A1 B1	Allow for error in measuring line XY. Accept only in range 1480 to 1560 inclusive. FT 'their 1520' ÷ 100. Unsupported 14·8 to 15·6 inclusive gains all 3 marks.
<u>Alternative method</u> *Sight of scale is 1cm represents 2m* *'measured length' × 2* *= 15·2 metres*	*B1* *M1* *A1*	*Allow for error in measuring line XY.* *Accept only in range 14.8 to 15.6 inclusive.*
20.(a) 9·231	B1	
20.(b) 170	B1	
20.(c) 10	B1	

1.(c) 22	B1	
2.(a) 	B1	
2.(b) 	B1	
2.(c) 	B1	
2.(d) Two squares shaded to form a correct net, e.g. 	B1	One square above the four given squares and one below.

17.(a) Position of *C* 300° from *B*	B1	Allow tolerance of ±2°. Allow any unambiguous indication that the correct bearing has been drawn (e.g. dot, cross).
Position of *C* 7cm from *B*	B1	Allow tolerance of ±2 mm.
17.(b) (AC =) 53 (km)	B1	**Strict** FT 'their AC' × 5, with tolerance of ±1 km.
Bearing = 018°	B1	**Strict** FT from their diagram. Must be a three-figure bearing. Allow tolerance of ±2°

9. 2 rectangles 3 cm by 4 cm correctly placed 2 rectangles 5 cm by 4 cm correctly placed	B1 B1	

8(a)(i) 440 × 48 ÷ 2.2 9600 (kg)	M1 A1	May be seen in stages Mark final answer Allow answers in the inclusive range 9588 to 9601 from premature approximation Answer space takes precedence
8(a)(ii) 230 000 000 000	B1	
8(b) (Area) 2.47 × 40000 ÷ 10000 or equivalent 9.88 (acres) (Density of trees) 615 ÷ 9.88 62(.2...trees per acre) (>60)	 M1 A1 m1 A1	**Throughout, if 4 marks are awarded, penalise -1 if conclusion 'Yes' is not indicated** **On FT the conclusion may be different to 'Yes'** May be implied in further working Allow 9.8 (acres), 9.9 (acres) or 10 (acres) Depends on M1 m1 previously awarded
8(b) Alternative method 1 *(Area) 2.47 × 40 000 ÷ 10 000 or equivalent* *9.88 (acres)* *(Maximum number of trees) 9.88 × 60* *592(.8) (trees) or 593 (trees) (< 615)*	*M1* *A1* *m1* *A1*	*May be implied in further working* *Allow 9.8 (acres), 9.9 (acres) or 10 (acres)* *Depends on M1 m1 previously awarded* *Allow suitable rounding, e.g. 590 or 600*
8(b) Alternative method 2 *(Area) 2.47 × 40 000 ÷ 10 000 or equivalent* *9.88 (acres)* *(Minimum area) 615 ÷ 60* *10.25 (acres) (> 9.88)*	*M1* *A1* *M1* *A1*	*May be implied in further working* *Allow 9.8 (acres), 9.9 (acres) or 10 (acres)* *Do not allow embedded in further working* *Allow rounded to 10 (acres) provided 'their area' ($9.88m^2$) has not been rounded to 10*
8(b) Alternative method 3 *(Minimum area) 615 ÷ 60* *10.25 (acres)* *(Convert to m^2) 10000 × 10.25 ÷ 2.47* *41497(.97 m^2) or 41498(m^2) (>40000)*	*M1* *A1* *m1* *A1*	*May be implied in further working* *Allow 10 (acres)* *Depends on M1 m1 previously awarded* *Accept suitable rounding, e.g. 41000 or 41500*
8(b) Alternative method 4 *(Trees in 2.47 acres) 615 ÷ (40000 ÷ 10000) or equivalent* *153.75 (trees)* *(Density of trees) 153.75 ÷ 2.47* *62(.2...trees per acre) (> 60)*	*M1* *A1* *m1* *A1*	 *May be implied in further working* *Allow 153, 153.8 or 154 (trees)* *Depends on M1 m1 previously awarded*
8(b) Alternative method 5 *(Forest area per tree) 40000 ÷ 615* *65(.0406.. m^2)* *(Fire risk, area per tree) 10 000 ÷ (60 × 2.47)* *67(.476...m^2) (> 65)*	*M1* *A1* *M1* *A1*	*Do not allow embedded in further working*

8(c)(i) (Height of the tree =) $21 \times \tan 39$ 17.(…. m)	M2 A1	*OR alternative full method* M1 for $\tan 39 = \frac{\text{height of tree}}{21}$ CAO
8(c)(i) Alternative method 1 *Hypotenuse = 21/cos39* *(= 27.02…)* ***AND** Height* = $\sqrt{(27(.02)^2 - 21^2)}$ 16.9(7…m) to 17.(0..m)	*M2* *A1*	*M1 for Hypotenuse = 21/cos39* *(= 27.02…)* ***AND** Height*$^2 = 27(.02)^2 - 21^2$ *CAO*
8(c)(i) Alternative method 2 *(Angle of elevation)* $\tan^{-1}\frac{17}{21}$ *38.9(9…°) or 39(°)*	*M2* *A1*	*M1 tan (elevation)* $= \frac{17}{21}$ *CAO*
8(c)(i) Alternative method 3 *(Horizontal distance)* $\frac{17}{\tan 39}$ *20.9(98…m) or 21m*	*M2* *A1*	*M1 for* $\tan 39 = \frac{17}{\text{distance}}$ *CAO*
8(c)(ii) diameter $= \frac{1.75}{\pi}$ or (radius =) $\frac{1.75}{2 \times \pi}$ (Area of cross section =) $\pi \times (1.75 \div 2\pi)^2$ $\times 17 \div 2$ (Volume) answer in the range 2.07 (m^3) to 2.15 (m^3)	M2 M1 m1 A1	M1 for any one of the following: • $1.75 = \pi \times$ diameter • $1.75 = 2 \times \pi \times$ radius (Note: radius = $\frac{7}{8\pi}$ m, radius ≈ 0.28m) FT for 'their derived radius' provided it is from a calculation involving the use of π (Note: area of cross section = $\frac{49}{64\pi}$ m^2 area of cross section ≈ 0.24 m^2) FT provided previous M1awarded CAO, accept an answer of 2 (m^3) from correct working without sight of premature approximation leading to an answer outside the range

Unit 2: Intermediate Tier	Mark	Comments
7(a) Method **not directly** working with a stated or omitted number of hours difference		Methods may be shown in stages or be embedded Use this method if 2 separate numbers of hours are used, which may not be correct, i.e. ≠12 and ≠10, with or without indication of subtraction Penalise every additional **spurious** term by reducing the count of correct terms by 1*
0.324 × 8 × **(10 or 12)** × 7 × 80 ÷ 1000	M3	Allow '× 32.4' for '× 0.324' M2 for any 4 or 5 correct terms* M1 for any 3 correct terms*
0.324 × 8 × **(12 or 10)** × 7 × 80 ÷ 1000 **with** the intention to subtract	m1	Must be an indication of the intention to subtract, in either order **FT from 5 (or 6) consistent correct terms** for use of • the other value 10 or 12 respectively • 'their number of hours' are 13 **and** 11 (incorrect) Award m0 if inconsistent, i.e. not an equal number of **consistent correct terms*** between the expressions. Mark 'their better stated calculation' first if both are given
(Saving is 17.418… – 14.515…=) (£) 2.90	A1	CAO All working must be checked, do not award 5 marks for £2.90 from incorrect working.
Alternative method: *Method **directly** working with a stated or omitted number of hours difference*		*Methods may be shown in stages or be embedded* *Use this method if a single number of hours is used, which may not be correct, i.e. ≠2, or if the number of hours is omitted* *Do not allow 2 hours as a correct term from incorrect working, e.g. 13 – 11 = 2* *Penalise every additional **spurious** term by reducing the count of correct terms by 1**
0.324 × 8 × 2 × 7 × 80 ÷ 1000	*M4*	*Allow '× 32.4' for '× 0.324'* *M3 for any 5 correct terms** *M2 for any 4 correct terms** *M1 for any 3 correct terms**
(Saving is) *(£) 2.90*	*A1*	*CAO* *All working must be checked, do not award 5 marks for £2.90 from incorrect working.*

Unit 2: Intermediate Tier	Mark	Comments
7(b) Height = $\tan 68° \times 3.3$ or height = $\frac{\sin 68° \times 3.3}{\sin(90-68)°}$	M2	Or alternative correct full method, isolating height M1 for $\tan 68° = \text{height} / 3.3$ or $\frac{\text{height}}{\sin 68°} = \frac{3.3}{\sin(90-68)°}$ or equivalent
8.167… (m) or 8.17 (m) or 8.2 (m)	A1	Allow 8(m), 8.1(m) 8.16(m) from correct working

End of solutions