

REVISE

.wales

F1.08 – Percentage change & multipliers

Mark schemes for the F1.08 question pack

Spec 1.4.8, 1.4.9, 1.4.10 – Unit 1

SOLUTIONS · 2025 SPECIFICATION

Mark schemes for the 14 questions in the corresponding revise.wales question pack (31 marks total). Sources: legacy WJEC GCSE papers, WJEC SAM, and custom-authored mark schemes. Pack layout © revise.wales.

<p>8.</p> <p>(EC = Side of the square \Rightarrow) $\frac{28}{4}$ $= 7(\text{cm})$</p> <p>(Area of triangle CDE \Rightarrow) $\frac{7 \times DE}{2} = 35(\text{cm}^2)$</p> <p>(DE \Rightarrow) $10(\text{cm})$</p> <p>Organisation and Communication.</p> <p>Accuracy of writing.</p>	<p>M1</p> <p>A1</p> <p>M1</p> <p>A1</p> <p>OC1</p> <p>W1</p>	<p>B0 if not a whole number.</p> <p><i>Lengths may be seen on the diagram.</i></p> <p>Any side of square shown as 7(cm) is M1A1.</p> <p>FT 'their stated or shown length for EC'.</p> <p>For OC1, candidates will be expected to:</p> <ul style="list-style-type: none"> • 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 <p>For W1, candidates will be expected to:</p> <ul style="list-style-type: none"> • show all their working • make few, if any, errors in spelling, punctuation and grammar • use correct mathematical form in their working
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<p>8.(a) (1 mile =) $\frac{8}{5}$(km) or 1600(m) or equivalent</p> <p>(Difference =) $\frac{8}{5} \times 1000 - 1.5 \times 1000$</p> <p style="text-align: right;">100 (metres)</p>	<p>B1</p> <p>M1</p> <p>A1</p>	<p>For sight of a correct conversion e.g. 5 miles = 8km , 1 km = $\frac{5}{8}$ mile. Allow more accurate correct approximations (for <u>all</u> marks) only if in the range [1609(m) to 1610(m)]</p> <p>No FT from an incorrect conversion. Allow M1 for $\frac{8}{5} - 1.5 (= 0.1)$ or equivalent.</p> <p>Allow -100 (metres). If no marks gained then allow SC1 for sight of $(1.5 \times \frac{5}{8})$</p>
<p>8.(b) 4×100^2</p> <p style="text-align: right;">= 40000</p>	<p>M1</p> <p>A1</p>	<p>Also for alternative correct methods e.g. (A 4x1 rectangle followed by) a 400×100 calculation, 200×200, etc.</p>

10.(a)	$\times 0.88^3$	B1	
10(b)	$\frac{45.9 - 42.5}{42.5} (= 0.08)$ OR $\frac{45.9}{42.5} (= 1.08)$	M1	May be seen in parts.
	0.08×100 OR $(1.08 \times 100) - 100$	m1	
	8(%)	A1	C.A.O. If no marks awarded allow SC1 for -8(%)

13.	Sight of 1.25 or 125(%)	B1	Allow $\frac{1}{4}$ Small square. Accept sight of n and 1.25n where n may be any numerical value e.g. '18 and 22.5'.
	$\frac{n}{1.25n} (\times 100)$	M1	$\frac{1}{1.25} \quad (n \neq 1) \quad \text{OR} \quad 0.8 \text{ implies B1M1.}$
	= 80(%)	A1	An answer of 80(%) gains B1M1A1

<p>13. $5x - 17 + 2x + 9 + x + 20 = 180$ $8x = 168$ $x = 21$</p> <p>Substituting $x = 21$ into at least one expression. $(5x - 17 =) 88(^{\circ})$ $(2x + 9 =) 51(^{\circ})$ $(x + 20 =) 41(^{\circ})$ (So not a right-angled triangle)</p>	<p>M1 A1 A1</p> <p>M1 A1</p>	<p>F.T. from $ax = b$. Allow all 3 marks for $x = 21$.</p> <p>If $x \neq 21$ FT 'their <u>derived</u> value of x'. F.T. for this A1 if $x \geq 4$. Any two of these expressions correctly evaluated with no incorrect evaluation, provided the sum of the two found is > 90. (statement not required). <u>Note</u> If further work indicates that the values found are not treated as angles (e.g. showing $51^2 + 41^2 \neq 88^2$) then award final MOA0.</p>
<p><u>Alternative method</u> $5x - 17 = 90$ OR $2x + 9 = 90$ OR $x + 20 = 90$ $x = 21.4$ AND $x = 40.5$ AND $x = 70$</p> <p>Then verifying: If $x = 21.4$: $5x - 17 + 2x + 9 + x + 20 = 183.2$ AND If $x = 40.5$: $5x - 17 + 2x + 9 + x + 20 = 336$ AND If $x = 70$: $5x - 17 + 2x + 9 + x + 20 = 572$ (So not a right-angled triangle)</p>	<p>M1 A2</p> <p>A2</p>	<p>Award A1 for any one of these: $x = 21.4$ OR $x = 40.5$ OR $x = 70$</p> <p>Award A1 for any one of these: If $x = 21.4$: $5x - 17 + 2x + 9 + x + 20 = 183.2$ OR If $x = 40.5$: $5x - 17 + 2x + 9 + x + 20 = 336$ OR If $x = 70$: $5x - 17 + 2x + 9 + x + 20 = 572$</p>
<p>14. $(AB =) 13.8 \times \cos 41$ OR $13.8 \times \sin 49$ $= 10.4(\dots)$ (cm)</p>	<p>M2 A1</p>	<p>M1 for $\cos 41 = \frac{AB}{13.8}$ OR $\sin 49 = \frac{AB}{13.8}$</p>
<p><u>Alternative method:</u> Correct use of 'two-step' method. $(AB) = 10.4(\dots)$(cm)</p>	<p>M2 A1</p>	<p>A partial trigonometric method is M0. Accept an answer that rounds to 10.4(cm)</p>
<p>15.a(i) $x^3 + 7x$</p>	<p>B2</p>	<p>B1 for sight of $x^3 + \dots$ OR $\dots + 7x$. Do not accept $x \times x \times x + x \times 7$ etc. Mark final answer.</p>
<p>15(a)(ii) $3x^2 - 4x - 15x + 20$ $3x^2 - 19x + 20$</p>	<p>B1 B1</p>	<p>Must be an expression. FT from an error in only one term (out of 4) only if of the form $ax^2 \pm bx \pm cx \pm d$.</p>
<p>15.(b)(i) $5n - 27 < n$ OR $n > 5n - 27$</p>	<p>B2</p>	<p>Allow B2 for an equivalent correct inequality. e.g. $4n - 27 < 0$. B1 if \leq or \geq used in a 'correct' inequality. OR B1 for $5n - 27 > n$ OR $n < 5n - 27$</p>
<p>15.(b)(ii) $4n < 27$ $n < \frac{27}{4}$ (Greatest number of clocks =) 6</p>	<p>B1 B1 B1</p>	<p>FT 'their inequality' if of equivalent difficulty. FT only from an $< b$ OR an $\leq b$ OR an $> b$ OR an $\geq b$. FT only from $n < c$ where c is positive OR $n \leq d$ where d is positive and not an integer An answer of 6 gains all 3 marks.</p>

2(a) one hundred and ninety-five thousand	B1	Do not accept <ul style="list-style-type: none">one hundred thousand and ninety-five thousand195 thousand
2(b) Caernarfon Castle	B1	Allow (+)0.2(%) as indication of Caernarfon Castle
2(c) $255949 + 260153$ 516 102	M1 A1	
2(d) $452007 - 319131$ 132 876	M1 A1	Allow $319131 - 452007$ Allow -132 876

<p>2(e) Yes and valid reason given e.g.</p> <p>'Yes, because 455 428 is nearly 500 000'</p> <p>'Yes, because if you round up 455 428 to the nearest hundred thousand it is 500 000'</p> <p>'Yes, as 455 428 is closer to half a million than 400 000'</p> <p>'Yes, because rounding to the nearest 100 000 would give you half a million'</p>	<p>E1</p>	<p>Allow e.g.</p> <p>'Yes, because they had over 450 000'</p> <p>'Yes, as only about 50 000 away from half a million'</p> <p>'Yes, because 455 428 is <u>nearly</u> half a million'</p> <p>'Yes, as you would round up to the nearest 50 000'</p> <p>'Yes, as half a million is 500 000'</p> <p>'No because it is nearly 45 000 short'</p> <p>'No as it was only 455 428 so that's not quite half a million'</p> <p>'No, because it is closer to 450 000'</p> <p>'No because it is 460 000'</p> <p>'No, because it is about 50 000 below'</p> <p>'No, because it is just over 450 000'</p> <p>'No, because the number is below 500 000 so it isn't half a million'</p> <p>'No, because half a million is 500 000 but the number is 455 428'</p> <p>'No because it would be in the 500 000 so he is wrong because 455 428 is less than half a million'</p> <p>Do not accept e.g.</p> <p>'Yes, because 455 428 is <u>about</u> half a million' – this is the statement given</p> <p>'No, because it's only 455 428'</p> <p>'No because 455 428 isn't close to half a million as it is in the 4s'</p> <p>'No, because they got 455 428'</p>
<p>2(f) Evidence of counting squares inside shape Answer in range 14 to 20</p> <p>Correct evaluation of 'their area' × 4 and manager correct Or 48 ÷ 4 = 12 and manager correct</p>	<p>M1 A1</p>	<p>E1</p> <p>FT if M1 awarded for a correct evaluation of 'their area' × 4 and conclusion made consistent with their answer OR 'their area' is in the range 13 to 22 with 'their area' × 4 correct and manager correct</p>
<p><u>Alternative method</u> Evidence of splitting each square into 4 Answer in range 56 to 80 Correct evaluation (conclusion) of the area with manager correct</p>	<p>M1 A1 E1</p>	<p>Or for counting up in 4s up to at least 20 Must not come from incorrect work FT if M1 awarded with conclusion made consistent for 'their area' OR 'their area' is in the range 52 to 88 with correct conclusion</p>

<p>8(a) (Population in 1964) $\frac{100 + 682}{100} \times 30000$ or 7.82×30000 or $30000 + 30000 \times \frac{682}{100}$ or equivalent</p> <p>(Population in 2014) $\frac{100 + 20}{100} \times 234600$ or 1.2×234600</p> <p style="text-align: right;">281520 (people)</p>	<p>M1</p> <p>M1</p> <p>A1</p>	<p>(= 234600 people) M0 for $6.82 \times 30000 (= 204600)$ or $1.682 \times 30000 (= 50460)$</p> <p>FT 'their derived 234600' including $1.2 \times 204600 (= 245520)$ $1.2 \times 50460 (= 60552)$</p> <p>CAO</p>
<p>8(b) $287106 \div 432$</p> <p style="text-align: right;">660 (people per km²)</p>	<p>M1</p> <p>A2</p>	<p>A1 for sight of 664.597.... rounded or truncated</p>
<p>8(c) $1442 \times 1000 \div 1\,000\,000$</p> <p style="text-align: right;">1.4(42 g/cm³)</p>	<p>M1</p> <p>A1</p>	<p>Mark final answer Allow M1 A1 for $1442 \div 1000 = 1.4(42)$ Do not accept from incorrect working, e.g. M0 A0 if 1.442 seen with an incorrect statement, e.g.</p> <ul style="list-style-type: none"> • "1 g = 1000 kg" • "g to kg is $\div 1000$"

17. $\frac{64 \times 100}{160}$ OR $\frac{64}{1.6}$ or equivalent = 40	M1 A1	Do not award M1 for $160\% = 64$. Award M1A1 for an embedded answer (e.g. $40 \times 1.6 = 64$ or $\frac{64}{40} \times 100 = 160$), BUT only M1A0 if contradicted by stating original amount $\neq 40$. Unsupported 40 is awarded M1 A1. Unsupported 40% is awarded M0 A0.
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<p>15.(a)</p> <p>$(x =) \sin^{-1} \frac{7.7}{11.3}$ or $\sin^{-1} \frac{7.7 \times \sin 90}{11.3}$ or equivalent</p> <p>Allow an answer between 42.8 and 43(°) ISW</p>	<p>M2</p> <p>A1</p>	<p>Check diagram for answers Award M1 for one of the following:</p> <ul style="list-style-type: none"> $\sin x = \frac{7.7}{11.3} (= 0.68(1..))$ $\frac{\sin x}{7.7} = \frac{\sin 90}{11.3}$ or equivalent <p>Allow correct angles given in radians or gradians:</p> <table border="1" data-bbox="852 398 1369 548"> <thead> <tr> <th>Method</th> <th>Radians</th> <th>Gradians</th> </tr> </thead> <tbody> <tr> <td>$\sin^{-1} \frac{7.7}{11.3}$</td> <td>0.7496...</td> <td>47.727....</td> </tr> <tr> <td>$\sin^{-1} \frac{7.7 \times \sin 90}{11.3}$</td> <td>0.655...</td> <td>47.001</td> </tr> </tbody> </table>	Method	Radians	Gradians	$\sin^{-1} \frac{7.7}{11.3}$	0.7496...	47.727....	$\sin^{-1} \frac{7.7 \times \sin 90}{11.3}$	0.655...	47.001
Method	Radians	Gradians									
$\sin^{-1} \frac{7.7}{11.3}$	0.7496...	47.727....									
$\sin^{-1} \frac{7.7 \times \sin 90}{11.3}$	0.655...	47.001									
<p>15.(a) <u>Alternative method</u> Correct use of a 'two-step' method.</p> <p>Allow an answer between 42.8 and 43(°) ISW</p>	<p>M2</p> <p>A1</p>	<p>A partial trigonometric method is M0.</p> <p>Allow 42.8(...°)</p> <p>Allow correct angles given in radians or gradians.</p>									

$$DBE = (90 - 43) = 47(^{\circ}) \quad \text{OR} \quad BED = 43(^{\circ})$$

Valid method to find the length DE

$$DE = 13.1 \times \tan 47$$

$$DE = \frac{13.1}{\tan 43}$$

$$DE = \frac{13.1 \times \sin 47}{\sin 43}$$

DE in the range 14.04 to 14.1 (cm) ISW

B1 **Strict FT** for $DBE = 90 - \text{'their } x\text{'}$ or $BED = \text{'their } x\text{'}$, provided $\text{'their } x\text{'} \neq 45^{\circ}$.
 Note: DBE must be acute for B1.
 May be implied in further work.

M2 If B1 already awarded for $\text{'their angle } DBE\text{'}$ but then $\text{'their angle } BED\text{'}$ is incorrect and $\text{'their } BED\text{'}$ is then used (or vice versa) for either M2 or M1, then award B0 previously.

Or award M2 for correct use of a 'two-step' method (e.g. $\text{'Pythagoras and similar triangles'}$ or $\text{'Pythagoras and correct trigonometric relationship'}$).

FT $\text{'their angle } DBE\text{'}$ or $\text{'their angle } BED\text{'}$ provided not 0° , 45° , 90° or 180° .

Award M1 for one of the following:

- $\tan 47 = \frac{DE}{13.1}$
- $\tan 43 = \frac{13.1}{DE}$
- $\frac{DE}{\sin 47} = \frac{13.1}{\sin 43}$ or equivalent

For all M2 or M1 scenarios, FT their clearly stated or shown angle BED or DBE where appropriate.

For $\frac{13.1 \times \sin 47}{\sin 43}$ FT their clearly stated or shown angles BED and DBE **only** if $BED + DBE = 90^{\circ}$.

A1 Allow 14 from correct workings.
 FT from M2 only and provided that angle is acute and leads to a positive answer.

Award B1M2A0 for any of the following unsupported answers:

Method	Radians	Gradians
$13.1 \times \tan 47$	-1.63 to 1...	11.92 to 12
$\frac{13.1}{\tan 43}$	-8.743 to -5.36	16.35 to 16.5
$\frac{13.1 \times \sin 47}{\sin 43}$	-1.95 to 1.08	14.1 to 14.21

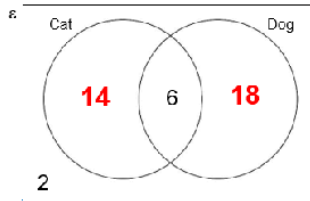
16.(a)	$\times 0.95$	B1	
16.(b)	Sight of 0.83 OR 83%	B1	Allow $(100 - 17 =) 83$
	$\frac{3569}{0.83}$ or $\frac{3569}{83} \times 100$ or equivalent	M1	FT 'their $1 - 0.17$ ' provided < 1 or 'their $100\% - 17\%$ ' provided $< 100\%$.
	= 4300	A1	Award B1M1A1 for an embedded answer (e.g. $0.83 \times 4300 = 3569$ or $\frac{3569}{4300} \times 100 = 83$), BUT only B1M1A0 if contradicted by stating original amount $\neq 4300$. Unsupported 4300 is awarded B1M1A1.

<p>9(a) (Sale price) $45 - 0.18 \times 45$ or $45 \times (1 - 0.18)$ or $45 - 8.1(0)$ or 45×0.82 <p style="text-align: right;">(£)36.9(0)</p> <p>(Maggie's mum pays) $8 \times 36.9(0) \div (8 + 1)$ or $36.9(0) - 36.9(0) \div (8 + 1)$ $8 \times 4.1(0)$ or $36.9(0) - 4.1(0)$ <p style="text-align: right;">(£)32.8(0)</p> </p></p>	<p>M1</p> <p>A1</p> <p>M1</p> <p>A1</p>	<p>May be seen or implied in further working</p> <p>FT 'their £36.90'</p> <p>On FT allow rounded or truncated to a penny</p>
<p>9(a) <u>Alternative method</u> (Maggie's mum's share of original price) $8 \times 45 \div (8 + 1)$ or $45 - 45 \div (8 + 1)$ <p style="text-align: right;">(£) 40</p> <p>(Maggie's mum pays) $40 - 0.18 \times 40$ or $40 \times (1 - 0.18)$ or $40 - 7.2(0)$ or 40×0.82 <p style="text-align: right;">(£)32.8(0)</p> </p></p>	<p>M1</p> <p>A1</p> <p>M1</p> <p>A1</p>	<p>May be seen or implied in further working</p> <p>FT 'their £40'</p> <p>On FT allow rounded or truncated to a penny</p>
<p>9(b) (Area) $\frac{1}{2} \times 1.5 \times (3.1 + 4.5)$ <p style="text-align: right;">5.7 (m²)</p> <p>(Charge) $2.5(0) \times 5.7$ <p style="text-align: right;">(£) 14.25</p> </p></p>	<p>M1</p> <p>A1</p> <p>M1</p> <p>A1</p>	<p>Accept rounding to 6 (m²) May be seen or implied in further working</p> <p>FT 'their 5.7' (including if previously rounded to 6), including if 'their 5.7' is not an area Allow if 'their area' is costed in parts provided there is an attempt to sum all of the part costs, provided 'their 5.7' \neq 1.5, 3.1 or 4.5</p> <p>CAO</p>

13.

$$[n(\text{just dog}) =] 18$$

$$[n(\text{just cat}) =] 14$$



B2

Diagram takes precedence.

Entries must be whole numbers.

B1 for sight of $(\frac{3}{5} \times 40 =) 24$ from correct working.

B1

FT 32 – 'their 18', provided all sections not blank or 0.

14.(a)	$£285 \times 0.96^3$	B1	
14.(b)	$\frac{34.2}{90} \times 100$ OR $\frac{34.2}{0.9}$ or equivalent = 38	M1 A1	Accept a complete and convincing method of trial and improvement. Award M1A1 for an embedded answer (e.g. $0.9 \times 38 = 34.2$ or $\frac{34.2}{38} \times 100 = 90\%$), BUT only M1A0 if contradicted by stating original amount $\neq 38$. Unsupported 38 is awarded M1A1.

Unit 1: Intermediate Tier	Mark	Comments
9(a)(i) 1×10^5	B1	
9(a)(ii) A suitable calculation, including an <u>appropriate</u> approximation, e.g. $\frac{3\,100\,000}{21\,000}$ or $\frac{3\,100\,000}{20\,000}$ or $\frac{3\,000\,000}{20\,000}$ or $\frac{3\,000\,000}{21\,000}$ or equivalent Answer in the range 142 (people/km ²) to 155 (people/km ²)	M2 A1	Place value must be correct Must include an approximation M1 for the idea to divide (in the correct order), that may also include one place value error, e.g. $\frac{3.1\,million}{20\,735}$, $\frac{31\,000\,000}{20\,000}$, $\frac{3\,100\,000}{20\,700}$ ISW. Allow 142.8, 142.9 and 143 rounded to 140 Accept equivalents, e.g. 150 written as 1.5×10^2
9(b) Idea that 360 000 is 120% $360\,000 \div 1.2$ or equivalent 300 000 (people)	B1 M1 A1	Accept from sight of trial to increase 'their value' by 20% provided 'their value' <360 000 Award of M1 also implies previous B1
9(c) (Length) $6.6 \div (4.2 \div 1.4)$ or $6.6 \div 3$ or equivalent Length 2.2 (cm) (Height) $4.2 \times (9.9 \div 6.6)$ or 4.2×1.5 or $1.4 \times (9.9 \div 2.2)$ or equivalent Height 6.3 (cm)	M1 A1 M1 A1	FT $1.4 \times (9.9 \div \text{'their derived length'})$ Note: Length (from $9.9 - 6.6 =$) 3.3(cm) M0 A0 Height (from $1.4 \times (9.9 \div 3.3) =$) 4.2(cm) M1 A1 (FT) Allow answers reversed in the answer space
9(c) <u>Alternative method</u> (Height) $4.2 \times (9.9 \div 6.6)$ or 4.2×1.5 or equivalent Height 6.3 (cm) (Length) $6.6 \div (4.2 \div 1.4)$ or $6.6 \div 3$ or $9.9 \div (6.3 \div 1.4)$ or equivalent Length 2.2 (cm)	M1 A1 M1 A1	FT $9.9 \div (\text{'their derived height'} \div 1.4)$ Allow answers reversed in the answer space