REVISE
.wales

F2.09 — Rearranging simple formulae

Mark schemes for the F2.09 question pack

Spec 2.1.16 — Unit 2

SOLUTIONS · 2025 SPECIFICATION

Mark schemes for the 9 questions in the corresponding revise.wales question pack (18 marks total). Sources: legacy WJEC GCSE papers, WJEC SAM, and custom-authored mark schemes.

8.(a)	a = 52° b = 52° c = 64°	B1 B1 B1	 OR FT b = 'their a'.
8.(b)	x = 64° y = 64° Isosceles.	B1 B1 B1	OR FT x = 'their c'. OR FT y = 180 – 52 – 'their x'. OR FT y = 180 – 64 – 'their a' OR FT y = 180 – 'their a' – 'their c' OR FT y = 180 – 'their b' – 'their c' C.A.O. Dependent on values given for <u>both</u> x and y AND two equal angles in triangle LMN AND x + y = 128.

10.(a) $3x^3 - 6x$	B2	Must be in an expression for B2. B1 for sight of $(+)3x^3$ or $-6x$. Mark final answer.
10.(b) $3g = 2 - f$ or $f - 2 = -3g$ $g = \frac{2-f}{3}$ or $g = \frac{f-2}{-3}$ or $g = \frac{2}{3} - \frac{f}{3}$	B1 B1	FT only from $\pm 3g = \pm f \pm 2$. B1B0 for $-g = \frac{f-2}{3}$. B1B0 for $g = 2 - f \div 3$. B1B0 for $\frac{2-f}{3}$ ('g=' missing). Mark final answer.
10.(c)(i) $7x < 32$ $x < 32/7$ or $x < 4\frac{4}{7}$	B1 B1	Use of '=' is B0B0 unless replaced for final answer. FT from $7x < k$. Allow $x < 4{\cdot}57(\ldots)$. Do not allow $x < 4{\cdot}6$ or $x < 4{\cdot}5$ unless $x < 4{\cdot}57(\ldots)$ seen. Mark final answer. Penalise consistent use of '≤' by −1
10.(c)(ii) 4	B1	OR F.T. 'their answer (inequality) in (c)(i)' if $x < a$. No FT from $x \le a$. 4x is B0.

8. P(Alison chooses letter R) = 2/10 or equivalent. P(Sarfraz chooses letter R) = ¼ or equivalent. Use of 2/10 × 100 OR ¼ × 100 20 AND 25 clearly implying that Sarfraz is the most likely to choose letter R	B1 B1 M1 A1	B1 for sight of 2/10 if unambiguously for Alison. B1 for sight of 1/4 if unambiguously for Sarfraz. As probability not asked for, allow e.g. '2 chances in 10' and 'one chance in four'. B1 marks may be implied in subsequent work. Calculation may be done in stages. There is no requirement to tick the box as long as there is no contradiction. Do not accept, on its own, e.g. 'Sarfraz has less letters to choose from' for the A1.
8. Alternative method *P(Alison chooses letter R) = 2/10* or equivalent. *P(Sarfraz chooses letter R) = ¼* or equivalent. *Attempting to give probabilities in a common format.* *Correct common format* *e.g. 4/20 AND 5/20 or 0·2 AND 0·25* *clearly implying that Sarfraz is the most likely to choose letter R*	*B1* *B1* *M1* *A1*	*B1 for sight of 2/10 if unambiguously for Alison.* *B1 for sight of 1/4 if unambiguously for Sarfraz.* *As probability not asked for, allow* *e.g. '2 chances in 10' and 'one chance in four'* *There is no requirement to tick the box as long as there is no contradiction.* *Do not accept, on its own, e.g.* *'Sarfraz has less letters to choose from' for the A1.*

9.(a) $3n + 5$ or equivalent	B2	B1 for sight of $3n$. B0 for $-3n$ Mark final answer.
9.(b) $3t = r + 8$ or $r + 8 = 3t$ or $-3t = -r - 8$ $t = \frac{r+8}{3}$ or $\frac{r+8}{3} = t$ or $t = \frac{-r-8}{-3}$	B1 B1	F.T. only from $3t = \pm r \pm 8$, stated or implied. ($3t = r + 8$ will have already gained the previous B1.) B1B0 for $-t = \frac{-r-8}{3}$ or equivalent. Mark final answer. *Note* *Allow B1B0 for $t = (r + 8) \div 3$ with or without brackets.* *Allow B1B0 for $\frac{r+8}{3}$ ('t' missing)*
9.(c) $6x + 4 = 46$ OR $3x + 2 = 23$ $6x = 42$ OR $3x = 21$ $(x =) 7$	B2 B1 B1	B1 for $(x + 5) + (2x - 3) + (x + 5) + (2x - 3) = 46$ or equivalent e.g. $(x + 5) + (2x - 3) = 23$ FT collection of 'their terms' if of equivalent difficulty. (linear equation only.) FT only from $ax = b$. Allow a fraction from a FT value unless x is a whole number. $(x =) 7$ gains all four marks. Each B mark implies all previous B marks. Mark final answer.
9.(c) Alternative method *A trial showing correct values and understanding of perimeter. (e.g. $2(4 + 5) + 2(2\times4 - 3) = 28$)* *An improved trial.* *$(x =) 7$*	*B1* *B1* *B2*	*Consistent use of x AND correct evaluation.* *Dependent on first B1.* *If 1st trial is using '7' award B1B1 followed by B1 if left embedded but B2 if shown as $x = 7$.* *B1 for an implied / embedded '$x = 7$' but not shown as $x = 7$.* *$(x =) 7$ gains all four marks.* *Mark final answer.*

11.(a) 360	B2	Mark final answer. B1 for $2^3 \times 3^2 \times 5$. OR B1 for any other common multiple e.g. 720, 1080 etc. unambiguously identified as a final answer. OR B1 for sight of correct prime factors e.g. $60 = 2^2 \times 3 \times 5$ or equivalent. AND $72 = 2^3 \times 3^2$ or equivalent. OR Accurate Venn diagram showing correct prime factors. OR B1 for sight of 60, 120, 180, 240, 300, 360, ... AND 72, 144, 216, 288, 360 with no further numbers
11.(b) For a single method that produces 2 prime factors from the set {2, 3, 3, 7, 7} before the 2nd error.	M1	Must be a method of 'repeated division'.
2, 3, 3, 7, 7	A1	C.A.O. For sight of the five correct factors (Ignore 1s)
$2 \times 3^2 \times 7^2$	B1	F.T. 'their primes' provided at least one index form used with at least a square. Do not F.T. non-primes. Allow $(2)(3^2)(7^2)$ and $2.3^2.7^2$ Do not allow $2,3^2,7^2$. Inclusion of 1 as a factor gets B0.
12. 6 −2	B2	B1 for each.
At least 5 correct plots and no incorrect plot.	P1	F.T. 'their (−1,6)' AND 'their (3,−2). Allow ±'½ a small square'.
A smooth curve drawn through their plots.	C1	F.T. 'their 7 plots' OR a curve through the 5 given plots AND (−1,6) AND (3,−2). Allow for the intention to pass through their plots. (within 1 small square, either horizontally **or** vertically of the point).
13. (Curved length =) 3·14 × 4 or equivalent = 12·56 (cm)	M1 A1	Do not allow M1 if subsequently divided by 2. Allow 4π for M1A1 Allow SC1 for an answer of 25·12 (whole circle). (If 12·56 shown, but then doubled, only award the SC1)
(Perimeter =) 20·56 (cm)	B1	FT 'their derived 12·56' + 8. (Even 'an area' + 8) Allow 4π + 8.

14.(a) $3k = p - 2$ or $p - 2 = 3k$ or $-3k = -p + 2$ $k = \frac{p-2}{3}$ or $\frac{p-2}{3} = k$ or $k = \frac{-p+2}{-3}$	B1 B1	F.T. only from $\pm 3k = \pm p \pm 2$, stated or implied. ($3k = p - 2$ will have already gained the previous B1.) B1B0 for $-k = \frac{-p+2}{3}$ or equivalent. Mark final answer. *Note* *Allow B1B0 for $k = (p - 2) \div 3$ with or without brackets.* *Allow B1B0 for $\frac{p-2}{3}$ ('k' missing)*
14.(b) (Midpoint =) (5, 17)	B2	B1 for each coordinate. May be given as $x = 5$ and $y = 17$. Accept use of $x = 5$ and $y = 17$ in $y = 3x + 2$. Allow B1 for sight of $\frac{3+7}{2}$ or $\frac{7-3}{2} + 3$ OR $\frac{15+19}{2}$ or $\frac{19-15}{2} + 15$ Allow SC1 for unsupported (17, 5).
Showing that $17 = 3 \times 5 + 2$ (convincing) AND 'Yes'	B1	FT 'their stated midpoint', but not (3,15) nor (7,19), with consequent calculation AND decision.
15.(a) $5{\cdot}8 \times 10^{-3}$	B1	
15.(b) 7×10^{5}	B2	B1 for sight of correct value not in standard form e.g. $0{\cdot}7 \times 10^{6}$ or 700000. Mark final answer.
16.(a) P(South Wales =) $1 - 0{\cdot}3 - 0{\cdot}25$ $= 0{\cdot}45$ AND shown on relevant branch. 0·2 and 0·8 shown on **all** relevant branches.	M1 A1 B1	
16.(b) $0{\cdot}45 \times 0{\cdot}2$ or equivalent $= 0{\cdot}09$ or equivalent	M1 A1	FT 'their completed tree diagram' for values $0<p<1$.
17. Showing $4x + 3y = 19$ or equivalent. Showing $6x - y = 12$ or equivalent. A correct method to eliminate one variable e.g. 'equal coefficients AND appropriate addition or subtraction'. OR ' method of substitution'. First variable found , $x = 2\frac{1}{2}$ or $y = 3$. Second variable found	B1 B1 M1 A1 A1	$2x + 2x + 3y = 19$ is an equivalent answer. *Workings must be shown for M1A1A1.* FT to solve for simultaneous equations if of equivalent difficulty. Allow one error in one term (not the term with equal coefficients.) C.A.O. for their equations FT substitution of their '1st variable' if M1 gained If NO (i.e. none of the five) marks gained, allow SC1 for both answers of $x = 2\frac{1}{2}$ AND $y = 3$

5. length = 2 × width	B1	**Answer lines take precedence** Note: correct answer 5·47…(cm) ≤ width ≤ 6·66..(cm) Must be in the correct order for B1.
Area = width × length	M1	M1 for **using** the correct method (not for stating the formula). FT 'their width' × 'their length'.
Area correctly evaluated AND > 60 (cm^2)	A1	
Perimeter = 2 × (width + length) or equivalent	M1	M1 for **using** the correct method (not for stating the formula). FT 2 × ('their width' + 'their length').
Perimeter correctly evaluated AND < 40 (cm)	A1	If answer space is left blank: • award full marks if correct length, width, area and perimeter clearly identified in working space or • penalise -1 if correct length, width, area and perimeter not clearly identified in working space. Penalise -1 if area and perimeter are reversed on the answer line but correct area and perimeter clearly identified in working space. Note: (W and L need not be whole numbers)

W	L	Area	Perimeter
6	12	72	36

7. (a) $12p - 20$	B1	Must be an expression. Mark final answer.
7. (b) $8m = w + 3$ or $w + 3 = 8m$ or $-8m = -w - 3$ $m = \frac{w+3}{8}$ or $\frac{w+3}{8} = m$ or $m = \frac{-w-3}{-8}$	B1 B1	Allow $-8m = -(w + 3)$. FT only from $\pm 8m = \pm w \pm 3$, stated or implied. (note: $8m = w + 3$ or $-8m = -w - 3$ will have already gained the previous B1). B1B0 for $-m = \frac{-3-w}{8}$ or equivalent. Mark final answer. <u>Note</u> Allow B1B0 for $m = (w + 3) \div 8$ with or without brackets. Allow B1B0 for $\frac{w+3}{8}$ ('$m =$' missing).
7. (c) $y^2 + y - 20$ ISW	B2	Allow $y^2 + 1y - 20$. Award B1 for one of the following: • $y^2 + 5y - 4y - 20$ • $y^2 + 5y - 4y + -20$ • $y^2 + 5y + -4y - 20$ • $y^2 + 5y + -4y + -20$ • $y^2 + ky - 20$ (where $k \neq 0$ or 1) • $y^2 + (1)y + t$ (where $t \neq -20$) • for sight of y^2 AND $+5y$ AND $-4y$ AND -20 but not in an expression.

			FT until 2nd error.
11.(a)	$7+5x-10=3x+8$ or equivalent.	B1	Bracket must be expanded or correct division by 5 e.g $x-2=\frac{3x}{5}+\frac{1}{5}$ (but not $x-2=\frac{3x+1}{5}$)
	$2x=11$ OR $-11=-2x$	B1	Or equivalent Correctly simplifying the equation to a single x term and number term (e.g. $2x-11=0$).
	$x=\frac{11}{2}$ or $5{\cdot}5$ or equivalent.	B1	Mark final answer. Correct answer implies B1B1B1. Do not allow $-x=\frac{-11}{2}$ or $x=\frac{-11}{-2}$ A final answer of '11 ÷ 2' is B1B1B0. If FT leads to a whole number answer, it must be shown as a whole number. Otherwise, accept a fraction. Allow any decimal answer to be rounded or truncated to 1 or more decimal place. Allow B1B1B1 for a correct embedded answer BUT only B1B1B0 if contradicted by $x\neq\frac{11}{2}$ or equivalent. Note: $12x-24=3x+8$ B0 $9x=32$ B1 (FT) $x=\frac{32}{9}$ or $3{\cdot}5(55\ldots)$ or $3{\cdot}6$. B1 (FT) If no marks awarded, award SC1 for sight of one of the following: • $5x-10$ • $12x-24$.
11.(b)	$2f=13-h$ or $h-13=-2f$	B1	Or equivalent.
	$f=\frac{13-h}{2}$ or $\frac{h-13}{-2}=f$ or equivalent	B1	Or equivalent. Must not come from incorrect working. Mark final answer. FT only from $\pm 2f=\pm 13\pm h$. Unsupported $f=\frac{\pm 13\pm h}{\pm 2}$ implies B0B1 unless B2. Award B1B0 for $-f=\frac{h-13}{2}$ or equivalent. **If no marks**, award SC1 for a final answer of either: • $f=(13-h)\div 2$ with or without brackets • $f=(h-13)\div -2$ with or without brackets • $\frac{13-h}{2}$ ('$f=$' missing). • $\frac{h-13}{-2}$ ('$f=$' missing).
11.(c)	$5(3x-7y)$	B1	Mark final answer. Allow $-5(-3x+7y)$ or $5(3x+-7y)$.