

# REVISE

.wales

## 3.02 – Simultaneous equations – algebraic & graphical

*Mark schemes for the 3.02 question pack*

*Spec 2.2.6, 2.4.7 – Unit 2*

SOLUTIONS · 2025 SPECIFICATION

*Mark schemes for the 7 questions in the corresponding revise.wales question pack (29 marks total). Sources: legacy WJEC GCSE papers, WJEC SAM, and custom-authored mark schemes. Pack layout © revise.wales.*

8. Method to eliminate variable e.g. equal coefficients with intention to <u>appropriately</u> add or subtract. First variable found $x = 5$ or $y = -2$ . Substitute to find the 2 <sup>nd</sup> variable. Second variable found	✓  ✓ ✓ ✓	M1  A1 m1 A1	B1 for a denominator of 20 in a fraction $< 1$ . <i>No marks for 'trial and improvement'.</i> Allow 1 error in one term, not one with equal coefficients.  C.A.O. F.T. their '1 <sup>st</sup> variable'.
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9. Method to eliminate variable e.g. equal coefficients with <u>appropriate</u> addition or subtraction. First variable found, $x = 3\frac{1}{2}$ or $y = 4$ . Substitute to find the 2 <sup>nd</sup> variable. Second variable found	M1  A1 m1 A1	<i>No marks for trial and improvement.</i> Allow 1 error in one term, not one with equal coefficients.  C.A.O. F.T. their '1 <sup>st</sup> variable'.
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<p>Organisation and Communication</p> <p>Accuracy of writing.</p>	<p>OC1</p> <p>W1</p>	<p>For OC1, candidates will be expected to:</p> <ul style="list-style-type: none"> <li>• present their response in a structured way</li> <li>• explain to the reader what they are doing at each step of their response</li> <li>• lay out their explanation and working in a way that is clear and logical</li> <li>• write a conclusion that draws together their results and explains what their answer means</li> </ul> <p>For W1, candidates will be expected to:</p> <ul style="list-style-type: none"> <li>• show all their working</li> <li>• make few, if any, errors in spelling, punctuation and grammar</li> <li>• use correct mathematical form in their working</li> <li>• use appropriate terminology, units, etc</li> </ul>
<p>3.(a) <math>A \cap B</math></p>	<p>B1</p>	
<p>3.(b) <math>B^c</math></p>	<p>B1</p>	
<p>4</p> <p>Four numbers with a range of 10. Four numbers with a total of 36. Four numbers with a median of 8. Possible answers for all three marks are 5,5,11,15 or 5,6,10,15 or 5,7,9,15 or 5,8,8,15</p>	<p>B1</p> <p>B1</p> <p>B1</p>	<p>B0 if all four original numbers used.</p>
<p>5. (number of females in Porth =) <math>\frac{90}{360} \times 128</math> OR (number of males in Porth =) <math>\frac{120}{360} \times 72</math></p> <p>(number of females in Porth =) 32 (number of males in Porth =) 24</p> <p>(Probability from Porth =) <math>\frac{56}{200}</math> or equivalent ISW</p>	<p>M1</p> <p>A1</p> <p>A1</p> <p>A1</p>	<p>Or equivalent</p> <p><i>Answers may be seen on the diagram.</i> An answer of 32 implies M1. An answer of 24 implies M1.</p> <p>FT ('their 32' + 'their 24') /200 provided M1 gained. Penalise incorrect notation –1. e.g. '56 in 200'.</p>
<p>6. <math>\sin(QPR) = \frac{9.6}{16.7}</math> (QPR =) <math>\sin^{-1}(9.6/16.7)</math> or <math>\sin^{-1}(0.57..)</math>  <math>= 35.1(^{\circ})</math> or <math>35.09(^{\circ})</math> or <math>35.089(...^{\circ})</math></p>	<p>M1</p> <p>m1</p> <p>A1</p>	<p>Implies M1.</p> <p>Allow any answer that rounds to <math>35(^{\circ})</math></p>
<p><u>6. Alternative method.</u> <b>Correct use of 'two-step' method.</b> (x) = <math>35.1(^{\circ})</math> or <math>35.09(^{\circ})</math> or <math>35.089(...^{\circ})</math></p>	<p>M2</p> <p>A1</p>	<p><i>A partial trigonometric method is M0.</i> Allow any answer that rounds to <math>35(^{\circ})</math></p>
<p>7. <math>7x + 2y = (\pounds)41.5(0)</math> AND <math>4x + 3y = (\pounds)29.75</math></p> <p>Method to eliminate variable (Attempt at equal coefficients and subtraction)</p> <p>First variable found <math>x = (\pounds)5</math> or <math>y = (\pounds)3.25</math>. Substitute to find the 2<sup>nd</sup> variable. Second variable found.</p>	<p>B1</p> <p>M1</p> <p>A1</p> <p>m1</p> <p>A1</p>	<p>Allow use of other letters to denote variables. B0 for using 4150 and 2975.</p> <p>FT 'their equations' if of equal difficulty. Allow 1 error in one term, not one with equal coefficients.</p> <p>C.A.O. (for their equations if FT.) F.T. their '1<sup>st</sup> variable'.</p> <p>FT answers should be given to the nearest penny (rounded or truncated). If M0, award SC2 (with possible B1) for <u>both</u> answers of <math>(\pounds)5</math> AND <math>(\pounds)3.25</math>.</p>

<p>6.</p> <p>Method to eliminate variable e.g. equal coefficients with intention to <u>appropriately</u> add or subtract'</p> <p>First variable found <math>x = 4</math> or <math>y = -3</math>. Substitute to find the 2<sup>nd</sup> variable. Second variable found</p>	<p>M1</p> <p>A1</p> <p>m1</p> <p>A1</p>	<p><math>MN = 12(-0..)(cm)</math> ISW A1</p> <p>No marks for 'trial and improvement'. No marks for an unsupported answer.</p> <p>Allow 1 error in one term, not one with equal coefficients.</p> <p>C.A.O.</p> <p>F.T. their '1<sup>st</sup> variable'.</p>
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4.(a)	an expression	B1	
4.(b)	an equation	B1	
5.	(Mid-points) 2·5, (7·5), 12·5 and 17·5. $8 \times 2\cdot5 + (0 \times 7\cdot5) + 7 \times 12\cdot5 + 5 \times 17\cdot5$ $(20 + 0 + 87\cdot5 + 87\cdot5 = 195)$ $\div 20$ $= 9\cdot75$	B1 M1  m1 A1	Allow for sight of mid-points. F.T. 'their mid-points' including bounds, provided they fall within the classes (including lower and upper bounds and used consistently). C.A.O.
6.	( x = ) $\frac{360}{15}$ or $180 - \frac{(15-2) \times 180}{15}$ or equivalent $= 24(^{\circ})$ (BR = ) $8 \times \cos 24$ or $8 \times \sin (90 - 24)$ $= 7\cdot3(0\dots)(\text{cm})$ or $7\cdot31(\text{cm})$	M1  A1 M2  A1	May be seen in parts.  FT 'their stated value for x' ( $x < 90^{\circ}$ ) M1 for $\frac{BR}{8} = \cos 24$ or $\frac{BR}{8} = \sin (90 - 24)$ Accept equivalent of using sin rule (as $\sin 90 = 1$ ).  <u>Alternative method to find BR</u> A correct and complete method (using two trigonometric relationships and possibly Pythagoras's theorem) M2 $BR = 7\cdot3(0\dots)(\text{cm})$ or $7\cdot31(\text{cm})$ A1
7.	$2\cdot656 \times 10^6$	B2	B1 for a correct value but not in standard form. Mark final answer. B1 for sight of 2 656 000. SC1 for $2\cdot66 \times 10^6$ or $2\cdot7 \times 10^6$ or $2\cdot6 \times 10^6$ or $2\cdot65 \times 10^6$
8.	Sight of 24·5 AND 15·5 OR Sight of 23·5 AND 14·5  $2(24\cdot5 + 15\cdot5) - 2(23\cdot5 + 14\cdot5)$ or equivalent  $= 4(\text{cm})$	B1  M1  A1	Sight of (Greatest =) 80 <u>OR</u> (Least =) 76 implies B1  FT only for upper bounds of 24·4 AND 15·4 or 24·49 AND 15·49 (lower bounds must be 23·5 AND 14·5 else M0)  CAO If M0, award B1 and an SC1 for sight of (Greatest =) 80 <u>AND</u> (Least =) 76
	<u>Alternative method.</u> Difference between least and greatest length for each side = 1(cm) $4 \times 1$  $= 4(\text{cm})$	B1  M1  A1	  FT only for differences of 0·9 or 0·99  CAO
9.	Method to eliminate variable e.g. equal coefficients with <u>appropriate</u> addition or subtraction. First variable found, $x = 4$ or $y = -1$ . Substitute to find the 2 <sup>nd</sup> variable. Second variable found	M1  A1 m1 A1	No marks for trial and improvement. Allow 1 error in one term, not the term with equal coefficients.  C.A.O. F.T. their '1 <sup>st</sup> variable'.  Award no marks for unsupported correct answers.

<p>6. Method to eliminate one variable e.g. 'equal coefficients AND <u>appropriate intention to add or subtract</u>' or use a method of substitution First variable found <math>x = 4</math> or <math>y = 7</math>.</p> <p>Substitute to find the 2<sup>nd</sup> variable. Second variable found.</p>	M1  A1  m1 A1	<p>Allow one error in one term (not the term with equal coefficients).</p> <p>CAO. Award A0 for an answer that leads to a whole number, but not expressed as a whole number (e.g. <math>y = 161/23</math> or <math>x = 92/23</math>)</p> <p>FT substitution of their '1<sup>st</sup> variable' if M1 gained. If FT leads to a whole number answer, it must be shown as a whole number. Otherwise accept a fraction.</p> <p>If no marks gained, allow SC1 for <u>both</u> answers of <math>x = 4</math> AND <math>y = 7</math>.</p>
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b. Method to eliminate one variable e.g. equal coefficients <b>AND</b> <u>appropriate intention to add or subtract</u> or use a method of substitution.	M1	Allow one error in one term (not the term with equal coefficients).
First variable found $x = 4.3$ or $y = 2.6$ or equivalent	A1	CAO Award A0 for expressing the final answers in a form such as $y = \frac{33.8}{13}$ .
Substitute to find the 2 <sup>nd</sup> variable.	m1	FT substitution of their '1 <sup>st</sup> variable' if M1 gained.
Second variable found	A1	No marks for 'trial and improvement'. No marks for an unsupported answer.

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End of solutions