



Proof & algebraic manipulation

Mark schemes for the Proof & algebraic manipulation question pack

WJEC Level 2 Additional Mathematics (9550) · Algebra

Official WJEC mark schemes for the 6 questions in the matching revise.wales question pack (24 marks total), from the 2011–2024 papers. Pack layout © revise.wales.

		4
5	$(a^2 - b^2 \Rightarrow) (v + u)^2 - (v - u)^2$ or $a^2 = v^2 + 2uv + u^2$ and $b^2 = v^2 - 2uv + u^2$ or $a^2 = v^2 + uv + uv + u^2$ and $b^2 = v^2 - uv - uv + u^2$ $(a^2 - b^2 \Rightarrow) v^2 + 2uv + u^2 - (v^2 - 2uv + u^2)$ or $(a^2 - b^2 \Rightarrow) v^2 + uv + uv + u^2 - (v^2 - uv - uv + u^2)$ $= 4uv$ or $uv + uv + uv + uv$ or $2uv + 2uv$ $= 4c$ <u>Alternative method 1</u> $a^2 - b^2 = (v + u)^2 - (v - u)^2$ $= (v + u - (v - u))(v + u + v - u)$ $= 2u(\times)2v \quad (=4uv)$ $= 4c$ <u>Alternative method 2</u> $a^2 - b^2 = (a + b)(a - b)$ $= (v + u + v - u)(v + u - (v - u))$ $= 2v(\times)2u \quad (=4uv)$ $= 4c$	B1 Ignore writing '= 4uv' or '= 4c' B1 Ignore writing '= 4uv' or '= 4c' Do not allow error with signs. Must show intention to subtract, do not allow missing brackets unless terms from within brackets treated correctly. B1 B1 Convincing, must show $4uv = 4c$ B1 Ignore writing '= 4uv' or '= 4c' B1 Ignore writing '= 4uv' or '= 4c' Do not allow error with signs. Must show intention of subtracting (v-u) as shown B1 B1 Convincing, must show $4uv = 4c$ B1 Ignore writing '= 4uv' or '= 4c' B1 Ignore writing '= 4uv' or '= 4c' Do not allow error with signs. Must show intention of subtracting (v-u) as shown B1 B1 Convincing, must show $4uv = 4c$ 4

<p>3</p>	<p>$\{ 55(x) - 22(x+3) + 10(x+5) \} \quad (/110)$</p> <p>$\{ 55x - 22x - 66 + 10x + 50 \} \quad (/110)$ $(43x - 16)/110$ or showing LHS = RHS</p>	<p>M1 B1 B1 A1</p>	<p>Attempt to use common denominator, may be implied by sight of $55(x) - 22(x+3) + 10(x+5)$ without sight of /110 May be seen in stages</p> <p>Or equivalent. May be seen in stages, as intention of method</p> <p>B1 for 1 slip (e.g. +66). Must be as a sum of 5 terms. Convincing must follow from fully correct working at each stage Allow following sight of 3 separate correct fractions with denominator 110 seen</p> <p><i>If no denominator then possible M1 (see note above), B1 B1 A0, however if denominator replaced later all marks are allowable</i></p>
<p>4</p>	<p>(a) $(y+\delta y =) \quad (x+\delta x)^2 + 7(x+\delta x) + 2$ Intention to subtract $(y =) x^2 + 7x + 2$ to find δy</p> <p>$(\delta y =) \quad 2x\delta x + (\delta x)^2 + 7\delta x$ Dividing by δx and $(\lim) \delta x \rightarrow 0$ $dy/dx = \lim_{\delta x \rightarrow 0} \delta y/\delta x = 2x + 7$</p>	<p>B1 M1 A1 M1 A1</p>	<p>Or alternative notation. Allow if final bracket omitted</p> <p>Accept δx^2 as meaning $(\delta x)^2$ FT equivalent level of difficulty CAO. Must follow from correct working and notation All notation throughout the working must be correct in order to award the final A1 Do not accept $dy/dx = \lim_{x \rightarrow 0} 2x + 7$ as a final answer</p> <p><i>Use of dy/dx throughout max 4 marks only, final A0</i></p>

Summer 2014			
4	$\frac{\{20(2x) - 15(x-7) + 12(3x+1)\}}{60}$ $\frac{\{40x - 15x + 105 + 36x + 12\}}{60}$ $\frac{(61x + 117)}{60}$ or showing LHS \equiv RHS	M1 B1 B1 A1 4	Attempt to use common denominator Or equivalent B1 for 1 slip (e.g. -105) Convincing must follow from fully correct working at each stage <i>If no denominator then M0 B1 B1 A0, however if denominator replaced later all marks are allowable</i>

		9	
4	$\{ 6(2x) - 21(x-3) + 2(3x+2) \} / 42$ $\{ 12x - 21x + 63 + 6x + 4 \} / 42$ $(67 - 3x) / 42$ or showing LHS \equiv RHS	M1 A1 A1 A1	Attempt to use common denominator Or equivalent A1 for 1 slip (e.g -63) Convincing If no denominator then MO B1 B1 A0, however if denominator replaced in later all marks are allowable

End of solutions