

Question			Answer	Marks	AO	Guidance	
7	(a)		$\frac{10-7}{h-1} = 2$	M1	1.1	Equate attempt at gradient of line to 2	Must be attempting to use $\frac{y_2 - y_1}{x_2 - x_1}$, with consistent order in numerator and denominator; allow one sign slip Could also use informal methods
			$h = \frac{5}{2}$	A1 [2]	1.1	Obtain $h = \frac{5}{2}$ oe	
7	(b)		(4, 13)	B1FT	1.1	Obtain correct x coordinate for C, following their h ie $2h - 1$	Must be clear that their $2h - 1$ is the x coordinate BOD if brackets omitted
				B1 [2]	1.1	Obtain correct y coordinate of 13	Must be clear that 13 is the y coordinate BOD if brackets omitted SC B1 if both values correct but given as a vector not a coordinate

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7	(c)		$y - 7 = 2(x - 1)$	M1	3.1a	Attempt equation of line through A	Allow one sign slip, but M0 if x and y coordinates transposed Could use their B or C instead, but must still be using gradient of 2
			$x^2 - 4x + k = 2x + 5$	M1	1.1	Equate line and curve	
			$x^2 - 6x + (k - 5) = 0$	A1	1.1	Obtain correct quadratic, with like terms collected	Condone no '= 0'
			$b^2 - 4ac = 36 - 4(k - 5)$	M1*	3.1a	Attempt discriminant of 3 term quadratic, resulting from equating line and curve	Correct discriminant for their quadratic Condone any inequality or equality, or no, sign for this mark M0 if using just $x^2 - 4x + k$ If the discriminant is initially embedded in the quadratic formula, then M1 is only awarded when it is considered in isolation
			Two points of intersection so $b^2 - 4ac > 0$ $36 - 4(k - 5) > 0$	M1d*	1.1	Use $b^2 - 4ac > 0$	Inequality sign could be implied by final answer M0 if incorrect inequality sign, including $b^2 - 4ac \geq 0$
			$56 - 4k > 0$ $k < 14$	A1	1.1	Obtain $k < 14$	
				[6]			
			Alt method for final 3 marks				
			$(x - 3)^2 - 9 + k - 5$	M1*		Attempt completed square form	Correct expression for their quadratic Allow unsimplified
			$k - 14 < 0$	M1d*		Set constant term < 0	M0 if constant term ≤ 0 May see more informal method to determine inequality sign
			$k < 14$	A1		Obtain $k < 14$	

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			Alt method (using differentiation to find point of intersection) $2x - 4 = 2$ $x = 3$ $y - 7 = 2(x - 1)$ $y = 11$ $9 - 12 + k = 11$ $k = 14$ One point of intersection when $k = 14$. It is a positive quadratic so translate in negative y direction for two points of intersection $k < 14$	M1 M1 M1 A1 M1 A1		Differentiate equation of curve, equate to 2 and attempt x Attempt equation of line through A Attempt y value from line, and use their (3, 11) in equation of curve to attempt k Obtain $k = 14$ Clear method to determine inequality sign Obtain $k < 14$	 Could use their B or C instead Could be algebraic or a sketch Could be implied by final answer