

Q	Marking instructions	AO	Marks	Typical solution
9(a)	Deduces one correct inequality related to the sloping line or the curve. Condones strict inequalities	2.2a	B1	$y \leq x + 2$ $y \geq x^2 - 4x - 12$ $y \geq 0$
	Deduces the other two correct inequalities Condones strict inequalities	2.2a	B1	
Subtotal			2	

Q	Marking instructions	AO	Marks	Typical solution
9(b)	States x coordinate of A is -2	1.1b	B1	$A \text{ is } (-2, 0)$ $B \text{ is } (6, 0)$ $x + 2 = x^2 - 4x - 12$ $x^2 - 5x - 14 = 0$ $(x + 2)(x - 7) = 0$ $C \text{ is point } (7, 9)$
	States x coordinate of B is 6	1.1b	B1	
	Eliminates y to obtain x coordinate of $C = 7$	1.1a	M1	
	Obtains correct y coordinates of A , B and C	1.1b	A1	
Subtotal			4	

Q	Marking instructions	AO	Marks	Typical solution
9(c)	Obtains correct value for area under AC	1.1b	B1	<p>Area of triangle under AC $= 0.5 \times 9 \times 9$ $= 40.5$</p> <p>Area below BC</p> $= \int_6^7 (x^2 - 4x - 12) dx$ $= \left[\frac{x^3}{3} - 2x^2 - 12x \right]_6^7$ $= \frac{343}{3} - 98 - 84 - 72 + 72 + 72$ <p>Shaded area $= 40.5 - 4\frac{1}{3}$</p> $= 36\frac{1}{6}$
	Integrates a quadratic expression with $\frac{x^3}{3}$ term correct PI by $\frac{13}{3}$ ACF	1.1a	M1	
	Integrates $x^2 - 4x - 12$ completely correct Condone inclusion of $+ c$ here PI by $\frac{13}{3}$ ACF Condone integration of $x^2 - 5x - 14$ correctly	1.1b	A1	
	Substitutes a pair of limits into their integrated quadratic, must be three terms, including subtraction. PI by $\frac{13}{3}$ ACF	1.1a	M1	
	Uses a correct method to combine areas that lead to the exact area of the shaded region	3.1a	M1	
	Obtains $36\frac{1}{6}$ or $\frac{217}{6}$ ISW	2.1	R1	
	Subtotal		6	

	Question 9 Total		12	
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