Que	stion	Scheme	Marks	AOs	
3(a)		$15 - 3^2 - 2 \times 3 = 0 *$	B1*	1.1b	
			(1)		
3(b)		Differentiate v wrt t	M1	2.1	
		-2t-2	A1	1.1b	
		8 (m s ⁻²)	A1	1.1b	
			(3)		
3(c)		Integrate v w.r.t. t	M1	1.1b	
		$15t - \frac{1}{3}t^3 - t^2$	A1	1.1b	
		Total distance = $\left[15t - \frac{1}{3}t^3 - t^2\right]_0^3 - \left[15t - \frac{1}{3}t^3 - t^2\right]_3^4$			
		OR $s_3 + (s_3 - s_4)$	M1	3.1a	
		where s_3 means the value of their integral when $t = 3$.			
		N.B. Allow the negative of this.			
		$\frac{94}{3}$ (m)	A1	1.1b	
			(4)		
		(8 marks)			
Notes:					
3a	B1*	Correct expression, correctly evaluated to give 0			
		OR $0 = 15 - t^2 - 2t$			
		<i>t</i> = 3			
3b	M1	Differentiate v, with at least two powers decreasing by 1			
	A1	Correct expression			
	A1	cao (must be positive)			
		N.B. If they give 8 as their answer, without any working, this can score all 3 marks.			
3c	M1	Integrate v, with at least two powers increasing by 1 (allow if only two terms integrated).			
	A1	rrect expression. Ignore (+ C)			
	M1	omplete method to find the total distance or displacement			
	A1	Accept 31(m) or better, must be positive			
		1			
		N.B. If the indefinite integral $(15t - \frac{1}{3}t^3 - t^2)$ is never seen, they score nothing, even if the			
		correct answer appears, as this indicates they have used a calculator to do th question.	e whole		

E.