

Question			Answer	Marks	AO	Guidance	
12			$-6t + 24 = 0$	M1	3.1b	Either attempt to differentiate and set $a = 0$ or attempt to complete the square $-3(t - 4)^2 + \dots$ to find t	Need $bt + 24 = 0$
			$T = 4$	A1	1.1		
			$\int (-3t^2 + 24t + k) dt$	M1*	1.1	Attempt to integrate v (at least two terms correct)	
			$= -t^3 + 12t^2 + kt (+c)$	A1	1.1		
			$\left(-4^3 + 12(4)^2 + 4k\right) - \left(-1^3 + 12(1)^2 + k\right) = 297$	M1dep*	2.1	Setting up an equation in k using 297, and $t = 1$ and their $t = 4$ and attempt to solve for k	If correct $k = 60$
			leading to $k = \dots$				
			$t^2 - 8t - 20 = 0$	M1	1.1	Setting $v = 0$ and attempt to solve three-term quadratic in t (perhaps BC)	Dependent on both previous M marks
			$(t - 10)(t + 2) = 0$				
			As $t \geq 0$, $t \neq -2 \therefore t = 10$	A1	2.3	Must see explicit rejection of negative value of t	
				[7]			