Question	Answer	Marks	Guidance
4(a)	Velocity at time T is $2T$ soi	**B1**	
	$\frac{1}{2}(8+4-T)\times 2T = 27$	**M1**	For an attempt trapezium area or three areas **and** = 27 using *their* 2T
	$(T-3)(T-9) = 0$	**M1**	**Dep** on previous **M1** for solving *their* 3-term quadratic by factorising, completing the square or quadratic formula
	3	**A1**	
	Alternative method		
	Velocity at time T is $2T$ leading to $T = \frac{v}{2}$ soi	**(B1)**	
	$\frac{1}{2}\left(8+4-\frac{v}{2}\right)\times v = 27$	**(M1)**	For an attempt trapezium area = 27 using *their* $\frac{v}{2}$
	$(18-v)(v-6) = 0$	**(M1)**	**Dep** on previous **M1** for solving *their* 3-term quadratic by factorising, completing the square or quadratic formula
	$v = 6$ then $T = 3$	**(A1)**	
4(b)	$a = \frac{0-\textit{their}2T}{8-4}$ oe	**M1**	For an attempt on gradient using *their T*
	−1.5	**A1**	Must be negative

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Question	Answer	Marks	Guidance
5	$\frac{dy}{dx} = 3x^2 + 3x - 2$	**M1**	Allow one error in the coefficient of x^2or x
	Gradient of tangent at $A = -2$ nfww	**A1**	
	Gradient of normal at $A = \frac{1}{2}$	**M1**	**Dep** for an attempt $-1 \div$ *their* gradient – must come from differentiation
	Equation of normal is $y - 1 = \frac{1}{2}x$ oe	**M1**	**Dep** for the normal equation using *their* normal gradient **and** $(0, 1)$
	$1+\frac{1}{2}x = x^3 + \frac{3}{2}x^2 - 2x + 1$	**M1**	**Dep** For solving simultaneously curve with normal **FT** *their* normal equation
	$x(2x^2 + 3x - 5) = 0$ oe nfww	**A1**	
	$[x](x - 1)(2x + 5) = 0$	**M1**	For an attempt solve *their* 3-term quadratic or trying to solve *their* cubic using long division
	$x = 1$ and $x = -\frac{5}{2}$ nfww	**A1**	
6(a)	$\frac{2}{\sqrt{3}}$ or $\frac{2\sqrt{3}}{3}$	**3**	**B2** for $[BM =]\frac{\sqrt{3}a}{2}$ or $\sec^2 30 = 1 + \left(\frac{1}{\sqrt{3}}\right)^2$ or $\cos^2 30 = 1 - \left(\frac{\frac{a}{2}}{a}\right)^2$ oe **B1** for $\left[BM^2 =\right] a^2 - \frac{a^2}{4}$ soi