Question	Scheme	Marks	Notes
Accept column vectors throughout			
2a	Use of $\mathbf{r} = \int \mathbf{v}\,\mathrm{d}t$	M1	Powers going up by 1. Allow one slip in the powers
	$\mathbf{r} = \left(\frac{4}{3}t^3 - \frac{5}{2}t^2 + A\right)\mathbf{i} + \left(-5t^2 - 12t + B\right)\mathbf{j}$	A1	Allow without constant of integration
	Use $t = 2$ and $\mathbf{r} = 2\mathbf{i} + 6\mathbf{j}$ when $t = 0$: $\mathbf{r} = \left(\frac{4}{3}\times 8 - \frac{5}{2}\times 4 + 2\right)\mathbf{i} + \left(-5\times 4 - 12\times 2 + 6\right)\mathbf{j}$	M1	Correct use of given value to obtain **r**
	$= \frac{8}{3}\mathbf{i} - 38\mathbf{j}$	A1	Correct answer only Allow 2.7 or better ISW if they go on to find the magnitude.
		(4)	
2b	**v** in direction of **i** - 2**j**	M1	Use velocity and direction to form an equation in T Condone if they have (-)2 on the wrong side of their equation
	$\Rightarrow -2\left(4T^2 - 5T\right) = \left(-10T - 12\right)$ $\left(8T^2 - 20T - 12 = 0\right)$	A1	Correct unsimplified equation in T (or t) only
	$\Rightarrow T = 3$	A1	Only. Allow $t = 3$.
		(3)	
2c	Use of $\mathbf{a} = \frac{\mathrm{d}\mathbf{v}}{\mathrm{d}t}$ $\left(\mathbf{a} = \left(8t - 5\right)\mathbf{i} - 10\mathbf{j}\right)$	M1	Powers going down by 1 Allow one slip in the powers
	Use of Pythagoras and $t = 2.5$	M1	Correct use of their derivative to obtain acceleration
	$\lvert a\rvert = \sqrt{\left(20-5\right)^2 + 10^2} = \sqrt{325}\left(= 5\sqrt{13}\right)\mathrm{m\,s^{-2}}$	A1	Any equivalent simplified exact form. Ignore decimals after exact answer seen.
		(3)	