Q	Solution	Mark	Guidance
1a			**Allow column vectors.**
	Use of $\mathbf{v}=\dfrac{\mathrm{d}\mathbf{r}}{\mathrm{d}t}$	M1	Powers going down by 1. At least 2 powers going down .
	$\mathbf{v}=\left(3t^2-8\right)\mathbf{i}+\left(t^2-2t+2\right)\mathbf{j}$	A1	Any equivalent form
	Use of $\mathbf{a}=\dfrac{\mathrm{d}\mathbf{v}}{\mathrm{d}t}$	M1	Powers going down by 1. At least 2 powers going down .
	$\mathbf{a}=6t\mathbf{i}+\left(2t-2\right)\mathbf{j}$	A1	Any equivalent form
	$=24\mathbf{i}+6\mathbf{j}\left(\mathrm{m\,s^{-2}}\right)$	A1	Must see acceleration stated as a correct simplified vector. ISW
		[5]	
1b	Direction $2\mathbf{i}+\mathbf{j}$	M1	Form equation in t or T only using direction. Condone use of 2 on the wrong side. Using their **v**
	$\Rightarrow\left(3T^2-8\right)=2\left(T^2-2T+2\right)$ $\left(T^2+4T-12=0\right)$	A1ft	Correct unsimplified **equation** in t or T. **Solving not required for the M1** Follow their **v**: **i** component = 2(**j** component)
	$T=2$	A1	Only Do not need to see method of solution.
		[3]	
		(8)	