

2(a)	$(3t - 1)\mathbf{i} + 2\mathbf{j} = 0.5\mathbf{a}$	M1	3.1a
	Integrate their \mathbf{a} wrt t	M1	2.1
	$(3t^2 - 2t)\mathbf{i} + 4t\mathbf{j}$ (+C)	A1	1.1b
	Find \mathbf{C} and substitute in $t = 2$	M1	1.1b
	$9\mathbf{i} + 7\mathbf{j}$ (m s^{-1})	A1	1.1b
		(5)	
2(b)	Integrate their \mathbf{v} wrt t	M1	2.1
	$(t^3 - t^2 + t)\mathbf{i} + (2t^2 - t)\mathbf{j}$ (+D)	A1ft	1.1b
	Solve problem by putting $t = 2$ and using Pythagoras, with square root	M1	3.1a
	$\sqrt{72}$ oe, 8.5 or better (m)	A1	1.1b
		(4)	

(9 marks)

Notes: Accept column vectors throughout

2a	M1	Use of $\mathbf{F} = m\mathbf{a}$, with $m = 0.5$ seen or implied
	M1	At least two powers increasing by 1
	A1	Correct vector expression
	M1	Use boundary condition to find \mathbf{C} and sub in $t = 2$
	A1	cao
2b	M1	At least two powers increasing by 1
	A1ft	Follow their \mathbf{v}
	M1	Putting $t = 2$ into their vector displacement expression and finding the magnitude
	A1	cao