Question Number	Scheme	Marks
6(a)	$\mathbf{r} = (-3\mathbf{i} + 4\mathbf{j})$ m	B1 (1)
(b)	$3.4 = 2T - 3$ or $-12 = 4 - 5T$ $T = 3.2$	M1 A1 A1 (3)
(c)	$\mathbf{r} = (-3\mathbf{i} + 4\mathbf{j}) + t(2\mathbf{i} - 5\mathbf{j})$ $\mathbf{v} = (2\mathbf{i} - 5\mathbf{j})$ speed $= \sqrt{\left(2^2 + (-5)^2\right)} = \sqrt{29} = 5.4\text{m s}^{-1}$ or better	M1 A1 M1 A1 (4) **8**
Alt (c)	$\lvert\mathbf{s}\rvert = \sqrt{6.4^2 + (-16)^2} = 17.23...$ $\therefore$ speed $= \frac{17.23}{3.2} = 5.4$ or better	M1 A1 M1 A1 (4)
	Notes	
6(a)	**Allow column vectors throughout.** B1 for $(-3\mathbf{i} + 4\mathbf{j})$ (m)	
(b)	M1 for a clear attempt at either 3.4 (**i**)= $(2T - 3)$ (**i**) or -12(**j**) = $(4 - 5T)$ (**j**) First A1 for a correct equation (either) without **i**'s and **j**'s A1 for 3.2 oe **N.B.** $T = \frac{6.4\mathbf{i} - 16\mathbf{j}}{2\mathbf{i} - 5\mathbf{j}}$ = 3.2 scores M1A1A1 BUT if RHS is not a single number, then M0. Also, if they get 3.2 and another value and don't clearly choose 3.2 then A0	
(c)	First M1 for a complete method for finding **v** e.g. $\mathbf{r} = (-3\mathbf{i} + 4\mathbf{j}) + t(2\mathbf{i} - 5\mathbf{j})$ so **v** = 2**i** – 5**j** OR: $\mathbf{v} = \frac{(3.4\mathbf{i} - 12\mathbf{j}) - (-3\mathbf{i} + 4\mathbf{j})}{\text{their } T}$ OR: $\mathbf{v} = \frac{\mathrm{d}\mathbf{r}}{\mathrm{d}t} = 2\mathbf{i} - 5\mathbf{j}$ First A1 for $2\mathbf{i} - 5\mathbf{j}$; M1A1 can be awarded for $2\mathbf{i} - 5\mathbf{j}$ only. Second M1 for attempt to find magnitude of their **v**, i.e. $\sqrt{2^2 + (-5)^2}$ Second A1 for √29 or 5.4 or better **OR** First M1 for attempt to find distance travelled: $d = \sqrt{(-3 - 3.4)^2 + (4 - -12)^2}$ First A1 if correct Second M1 for their d / their T Second A1 for √29 or 5.4 or better	