Question Number	Scheme	Marks
5(a)	Put $t = 2$ to give $-3\mathbf{i} + 4\mathbf{j}$	M1
	$\sqrt{(-3)^2 + 4^2}$ The – sign is not required	M1
	5 (m s^{-1})	A1
		(3)
(b)	e.g. $\tan\theta = \frac{3}{4}$	M1
	A correct equation	A1**ft**
	37° or 323° nearest degree	A1
		(3)
(c)	$\mathbf{v} = (7 - 5t)\mathbf{i} + (12t - 20)\mathbf{j}$	
	$= (7\mathbf{i} - 20\mathbf{j}) + t(-5\mathbf{i} + 12\mathbf{j})$	M1
	$\frac{\mathbf{v} - (7\mathbf{i} - 20\mathbf{j})}{t} = (-5\mathbf{i} + 12\mathbf{j})$	M1 A1
	OR: $t = 0$, $\mathbf{v} = 7\mathbf{i} - 20\mathbf{j}$	M1
	$\frac{(-3\mathbf{i} + 4\mathbf{j}) - (7\mathbf{i} - 20\mathbf{j})}{2} = (-5\mathbf{i} + 12\mathbf{j})$	M1A1
	OR: Differentiate wrt t	M2
	$\frac{\mathrm{d}\mathbf{v}}{\mathrm{d}t} = \mathbf{a} = (-5\mathbf{i} + 12\mathbf{j})$	A1
		(3)
(d)	$\frac{(7 - 5t)}{(12t - 20)} = \frac{-5}{8}$	M1 A1
	Solve for t	M1
	$t = 2.2$	A1
		(4)
		(13)

	Notes for Question 5	
5(a)	M1 Allow column vectors	
	M1 Finding the magnitude of their **v**	
	A1 Correct answer	
5(b)	M1 For a relevant trig equation	
	A1**ft** A correct equation follow through on their **v**	
	A1 Correct answer (must be in degrees to nearest degree)	
5(c)	M1 Collecting terms in t and constant terms (may be implied)	
	M1 Rearranging to required form	
	A1 Correct answer (isw if they find the magnitude)	
OR:	M1 Finding the initial velocity or some other specific velocity	
	M1 Use of $\mathbf{a} = \frac{\mathbf{v} - \mathbf{u}}{t}$ with $t = 2$ (or possibly another appropriate value)	
	A1 Correct answer (isw if they find the magnitude)	
5(d)	M1 Attempt at equation in t only, using ratio of components, allow reciprocal and a sign error	
	A1 Correct equation	

	M1 Solve for t (equation must have come from considering ratios)	
	A1 Correct answer	