Question Number	Scheme	Marks
2(a)	$\tan\theta = \frac{6}{7}$	M1
	$\theta = 40.60°...$	A1
	Bearing is $360° - 40.60° = 319°$ nearest degree	A1 (3)
(b)	$\mathbf{r}_A = (20\mathbf{i} - 17\mathbf{j}) + 4(-6\mathbf{i} + 7\mathbf{j}) = (-4\mathbf{i} + 11\mathbf{j})$	M1 A1
	$\mathbf{r}_B = (-8\mathbf{i} + 9\mathbf{j}) + 4(p\mathbf{i} + 2p\mathbf{j}) = (-8 + 4p)\mathbf{i} + (9 + 8p)\mathbf{j}$	A1
	$\mathbf{r}_A - \mathbf{r}_B = (4 - 4p)\mathbf{i} + (2 - 8p)\mathbf{j}$	**DM**1
	$-8 + 4p - -4 = 9 + 8p - 11$	M1 A1
	$p = -0.5$	A1
	$\mathbf{v}_B = (-0.5\mathbf{i} - \mathbf{j})$	M1
	$\lvert\mathbf{v}_B\rvert = \sqrt{(-0.5)^2 + (-1)^2}$	M1
	$= \frac{\sqrt{5}}{2} = 1.1\ \text{ms}^{-1}$ or better	A1 (10) **13**
	Notes	
2(a)	M1 for any trig ratio using 6 and 7: $\tan\theta = \pm\frac{6}{7}$ or $\pm\frac{7}{6}$: $\sin\theta$ or $\cos\theta = \pm\frac{6}{\sqrt{6^2+7^2}}$ or $\pm\frac{7}{\sqrt{6^2+7^2}}$	
	A1 for a correct angle from their *correct* equation e.g. 49°, 41°, 139°, 131°,….	
	A1 for 319° cao	
2(b)	First M1 for attempt at use of $\mathbf{r}_4 = \mathbf{r}_0 + 4\mathbf{v}$ for either *A* or *B*	
	First A1 for $(-4\mathbf{i} + 11\mathbf{j})$ **i**'s and **j**'s must be collected at some stage	
	Second A1 for $(-8 + 4p)\mathbf{i} + (9 + 8p)\mathbf{j}$ **i**'s and **j**'s must be collected at some stage	
	Second **DM**1, dependent on first M1, for finding the difference between their two $\mathbf{r}_4$ vectors (must be an attempt to subtract both **i** and **j** components)	
	Third M1 for equating the **i** cpt and **j** cpt of their difference (M0 if no difference) to give an equation in *p only*. oe e.g. $\frac{(4-4p)}{(2-8p)} = \frac{(-)1}{(-)1}$	
	Third A1 for a correct equation in *p* only	
	Fourth A1 for a correct value of *p*	
	Fourth M1 for using their *p* value to obtain a velocity vector for *B*	
	Fifth M1 for finding the magnitude of their $\mathbf{v}_B$ (**N.B.** This M mark is available, even if their $\mathbf{v}_B$ does not have the correct form)	
	Fifth A1 for $\frac{\sqrt{5}}{2}$ oe or 1.1 or better	