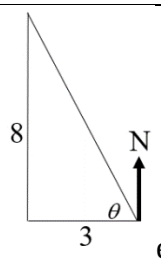
QUESTION NUMBER	SCHEME	MARKS
4(a)	$(5\mathbf{i}-8\mathbf{j})+5(-\lambda\mathbf{i}+2\lambda\mathbf{j})$ (m s^{-1}) isw	M1 A1
		(2)
4(b)	$13=\sqrt{(5-5\lambda)^2+(-8+10\lambda)^2}$	M1 A1
	$169=25-50\lambda+25\lambda^2+64-160\lambda+100\lambda^2$	
	$25\lambda^2-42\lambda-16=0$ *	A1* cso
		(3)
4(c)	$(-2\mathbf{i}+4\mathbf{j})$ seen or implied	B1
	$(5\mathbf{i}-8\mathbf{j})+(-2\mathbf{i}+4\mathbf{j})4$	M1A1
	 e.g. $\tan^{-1}\left(\pm\frac{8}{3}\right), \tan^{-1}\left(\pm\frac{3}{8}\right)$, $\sin^{-1}\left(\pm\frac{8}{\sqrt{73}}\right)$,...	M1
	339^o	A1
		(5)
		(10)
	Notes for question 4	
(a) **M1** **A1** **(b)** **M1** **A1** **A1***	Use of **v**=**u**+**a***t* to form a vector expression in λ and *t* Correct unsimplified expression with *t* = 5 **N.B.** Allow use of column vectors for the M mark but not for the A mark**.** Collect **i**'s and **j**'s and correct use of Pythagoras to form an equation in λ Correct equation cso. Expand brackets and correctly reach the GIVEN answer. **N.B.** Allow $0=25\lambda^2-42\lambda-16$	
(c) **B1** **M1** **A1** **M1** **A1**	Or column vector Complete method to find the velocity when *t* = 4. Correct unsimplified expression. Note the correct velocity is $\mathbf{v}=-3\mathbf{i}+8\mathbf{j}$ Use **their** velocity vector **at *t* = 4** with trig to find a relevant angle. Cao. Degrees sign not required. **N.B.** if they work with both values of λ, can score max all the marks except the last one.	