

Question Number	Scheme	Marks
1(a)	$\tan q = \frac{5}{20}$ $q = 14.036^\circ$ $q = 104^\circ$ nearest degree	M1 A1 A1 (3)
(b)	$\mathbf{p} = 400\mathbf{i} + t(15\mathbf{i} + 20\mathbf{j})$ $\mathbf{q} = 800\mathbf{j} + t(20\mathbf{i} - 5\mathbf{j})$	M1 A1 A1 (3)
(c)	Equate their j components: $20t(\mathbf{j}) = (800 - 5t)(\mathbf{j})$ $t = 32$ $\mathbf{s} = 800\mathbf{j} + 32(20\mathbf{i} - 5\mathbf{j})$ $= 640\mathbf{i} + 640\mathbf{j}$	M1 A1 M1 A1 (4) 10
1(a)	<p style="text-align: center;">Notes</p> <p>Allow column vectors throughout</p> <p>M1 for $\tan q = \pm \frac{5}{20}$ or $\pm \frac{20}{5}$ (or any other complete method)</p> <p>First A1 for $\pm 14.04^\circ$ or $\pm 75.96^\circ$</p> <p>Second A1 for 104°</p>	
1(b) (i) (ii)	<p>M1 for clear attempt at either p or q (allow slip but <i>t</i> <u>must</u> be attached to the velocity vector and position vector and velocity vector must be paired up correctly)</p> <p>First A1 $400\mathbf{i} + t(15\mathbf{i} + 20\mathbf{j})$ “p =” not needed but must be clear it’s <i>P</i></p> <p>Second A1 $800\mathbf{j} + t(20\mathbf{i} - 5\mathbf{j})$ “q =” not needed but must be clear it’s <i>Q</i></p>	
1(c)	<p>First M1 for equating their j components; allow j’s on both sides</p> <p>First A1 for $t = 32$</p> <p>Second M1 <u>independent</u> for substituting their <i>t</i> value into their q from (b)</p> <p>Second A1 for $640\mathbf{i} + 640\mathbf{j}$</p>	