

Question		Answer	Marks	AO	Guidance	
8	(a)	$[\mathbf{s} =] 2(\mathbf{i} + 3\mathbf{j}) + 0.5 \times 2^2 \times (-5\mathbf{i} + 2\mathbf{j})$ $\text{or } 2 \begin{pmatrix} 1 \\ 3 \end{pmatrix} + 0.5 \times 2^2 \times \begin{pmatrix} -5 \\ 2 \end{pmatrix}$ $[\mathbf{s} =] -8\mathbf{i} + 10\mathbf{j} \text{ (m)}$	<p>M1</p> <p>A1</p> <p>[2]</p>	<p>3.3</p> <p>1.1</p>	<p>Apply $\mathbf{s} = \mathbf{u}t + 0.5\mathbf{a}t^2$ correctly with correct values of \mathbf{u}, \mathbf{a} and t – if using integration then for this mark we must see the correct expression $\begin{pmatrix} 1 \\ 3 \end{pmatrix}t + \frac{1}{2} \times \begin{pmatrix} -5 \\ 2 \end{pmatrix}t^2$ with $t = 2$ subst.</p> <p>or $\begin{pmatrix} -8 \\ 10 \end{pmatrix}$</p>	<p>ISW if correct vector converted to scalar</p>
8	(b)	$\mathbf{v} = (\mathbf{i} + 3\mathbf{j}) + 2(-5\mathbf{i} + 2\mathbf{j})$ $\mathbf{v} = -9\mathbf{i} + 7\mathbf{j}$ $ \mathbf{v} = \sqrt{(-9)^2 + 7^2}$ $ \mathbf{v} = 11.4 \text{ (ms}^{-1}\text{)}$	<p>M1*</p> <p>A1</p> <p>M1dep*</p> <p>A1</p> <p>[4]</p>	<p>3.3</p> <p>1.1</p> <p>3.4</p> <p>1.1</p>	<p>Apply $\mathbf{v} = \mathbf{u} + \mathbf{a}t$ with correct values of \mathbf{u}, \mathbf{a} and t (or other complete method to find \mathbf{v})</p> <p>or as a column vector (possibly implied by correct magnitude)</p> <p>Correct method for the speed of P at time $t = 2$ – condone $\sqrt{-9^2 + 7^2} = \sqrt{\pm 81 + 49}$</p> <p>Allow $\sqrt{130}$ or awrt 11.4 www – must follow from correct $\mathbf{v} = -9\mathbf{i} + 7\mathbf{j}$ (so M1 A0 M1 A1 is not possible)</p>	<p>Allow from integration but must have correct expression for \mathbf{v} with $t = 2$ substituted</p> <p>11.4017542...</p>