

Question 1 (Total 6 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	$\mathbf{a} = 8\mathbf{i} - \frac{45}{2}t^{\frac{1}{2}}\mathbf{j}$	M1	This mark is given for a method to differentiate the expression for $\mathbf{v}$
		A1	This mark is given for correctly differentiating the expression for $\mathbf{v}$
	$= 8\mathbf{i} - \frac{135}{2}\mathbf{j} \text{ m s}^{-1}$	A1	This mark is given for substituting $t = 9$ to find a correct vector expression for the acceleration of P
(b)	$\mathbf{r} = (\mathbf{r}_0) + 4t^2\mathbf{i} - 6t^{\frac{5}{2}}\mathbf{j}$	M1	This mark is given for a method to integrate the expression for $\mathbf{v}$
		A1	This mark is given for correctly integrating the expression for $\mathbf{v}$
	$(-5\mathbf{i} + 3\mathbf{j}) + (64\mathbf{i} - 192\mathbf{j})$ $= 59\mathbf{i} - 189\mathbf{j} \text{ m}$	A1	This mark is given for substituting $t = 4$ to find a correct position vector of P