

Question number	Scheme	Marks
6 (a)	8 (m) (must be positive)	B1 [1]
(b)	$\frac{ds}{dt} = 3t^2 - 8t - 16$ $\frac{ds}{dt} = 0$ when P is stationary $\Rightarrow 3t^2 - 8t - 16 = 0$ $3t^2 - 8t - 16 = (3t + 4)(t - 4) = 0 \Rightarrow t = 4$	M1A1 M1A1 [4]
(c)	$\frac{d^2s}{dt^2} = 6t - 8$ $6t - 8 = 10 \Rightarrow t = 3$	B1ft M1A1 [3]
Total 8 marks		

Part	Mark	Notes
(a)	B1	For 8 (m) only
(b)	M1	For an attempt to differentiate the expression for s $\left[v \text{ or } \frac{ds}{dt} \right] = 3t^2 - 8t - 16$ See General guidance for the definition of an attempt with no terms integrated.
	A1	For the correct expression for v or $\frac{ds}{dt}$
	M1	For setting v or $\frac{ds}{dt} = 0$ and solving their 3TQ to find at least one value of t .
	A1	For $t = 4$ If two values of t are given $\left(t = -\frac{4}{3} \right)$ do not award this mark
(c)	B1ft	For the correct expression for the acceleration. Ft their $\frac{ds}{dt}$ The differentiation must be correct for this mark.
	M1	For setting their differentiated expression = 10 and solving for t
	A1	For $t = 3$