Question	Answer	Marks	Guidance
11(a)	$\dfrac{\left((t+1)\times\dfrac{3}{2}\times 2\times(2t+1)^{\frac{1}{2}}\right)-(2t+1)^{\frac{3}{2}}}{(t+1)^2}$	**3**	**B1** for $\dfrac{3}{2}\times 2\times(2t+1)^{\frac{1}{2}}$ **M1** for a correct attempt at a quotient or a product **A1** for all terms apart from $\dfrac{3}{2}\times 2\times(2t+1)^{\frac{1}{2}}$ correct
	$\dfrac{(2t+1)^{\frac{1}{2}}}{(t+1)^2}(t+2)$	**2**	**M1 dep** on previous M mark for attempt to obtain in the required form
	Alternative		
	$s=\dfrac{(2t+1)^{\frac{3}{2}}-t-1}{(t+1)}$ $\dfrac{\left((t+1)\times\left(3\times(2t+1)^{\frac{1}{2}}-1\right)\right)-\left((2t+1)^{\frac{3}{2}}-t-1\right)}{(t+1)^2}$	**(3)**	**B1** for $\dfrac{3}{2}\times 2\times(2t+1)^{\frac{1}{2}}$ **M1** for a correct attempt at a quotient or a product **A1** for all terms apart from $\dfrac{3}{2}\times 2\times(2t+1)^{\frac{1}{2}}$ correct
	$\dfrac{(2t+1)^{\frac{1}{2}}}{(t+1)^2}(t+2)$	**(2)**	**M1 dep** on previous M mark for attempt to obtain in the required form
11(b)	$(2t+1)^{\frac{1}{2}}(t+2)=0$ oe has no real positive solutions so velocity is never zero	**B1**	**FT** on *their* positive linear factor Reference needs to be made to both factors.

Question	Answer	Marks	Guidance
12	$a^5x^5 + 2a^4x^4 + \frac{8}{5}a^3x^3$	**3**	**B1** for each correct term, allow when first seen
	$1 - \frac{2b}{x} + \frac{b^2}{x^2}$	**B1**	
	$a = 2$	**B1**	
	$32 - 64b = -160$	**M1**	For using *their* expansions and *their* value for *a* to obtain two terms involving x^4
	$b = 3$	**A1**	
	$\frac{64}{5} - 192 + 288 = c$	**M1**	For using *their* expansions and *their* value for *a* to obtain three terms involving x^3
	$c = \frac{544}{5}$ oe	**A1**	
	Alternative		
	$a^5 (= 32)$	**(B1)**	
	$a = 2$	**(B1)**	
	$-2ba^5 + 2a^4 = -160$ soi $32 - 64b = -160$	**(2)**	**B1** for $2a^4$ soi **M1** For using *their* expansions and *their* value for *a* to obtain two terms involving x^4
	$b = 3$	**(A1)**	
	$\frac{8}{5}a^3 - 4a^4b + a^5b^2 = c$ $\frac{64}{5} - 192 + 288 = c$	**(3)**	**B2** for both $\frac{8}{5}a^3$ and a^5b^2 **B1** for either $\frac{8}{5}a^3$ or a^5b^2 if only one correct **M1** for using *their* expansions and *their* value for *a* to obtain three terms involving x^3
	$c = \frac{544}{5}$ oe	**(A1)**	