Question	Answer	Marks	Guidance
9(b)	$\frac{1}{2}\ln(2x+1)$	**B1**	
	$\frac{1}{2(2x+1)}$	**B1**	Allow $\frac{-(2x+1)^{-1}}{-1\times 2}$ oe
	$\ln(4x-1)$	**B1**	
	$\left(\frac{1}{2}\ln 3+\frac{1}{6}+\ln 3\right)-\left(\frac{1}{2}\ln 2+\frac{1}{4}\right)$	**M1**	For correct application of limits, must have at least one log term. Must be using individual fractions from **(a)** Fractions and log terms must be bracketed correctly and manipulated correctly
	$\frac{1}{2}\ln\frac{27}{2}-\frac{1}{12}$	**3**	**M1** for application of log laws using $\frac{1}{2}\ln 3+\ln 3-\frac{1}{2}\ln 2$ to obtain the correct form **A1** for $\frac{1}{2}\ln\frac{27}{2}$ **B1** for $-\frac{1}{12}$
10(a)	Common difference = $4\lg x$	**B1**	
	Sum to n terms = $\frac{n}{2}\left(2\lg x+(n-1)(4\lg x)\right)$	**M1**	For use of the sum formula with *their* common difference
	$n(2n-1)\lg x$	**2**	**Dep M1** for a correct attempt to rearrange to the required form **A1** cao
10(b)	$n(2n-1)=4950$	**M1**	For $n((\textit{their } p)n-1)=4950$ together with an attempt to solve to obtain n
	50	**A1**	cao
10(c)	$50(99)\lg x=-14850$	**M1**	For use of *their* n and p in a complete method to find x or use of part **(b)**
	10^{-3} or equivalent	**A1**	

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.