Question	Answer	Marks	Guidance
7(b)	$2\ln(2x+1)$ oe	**B1**	
	$-\frac{4}{2x+1}$ oe	**B1**	
	$\left(2\ln 2-\frac{4}{2}\right)-(-4)$	**M1**	For correct substitution of limits, must be using the form $a\ln(2x+1)+\frac{b}{2x+1}$
	$\ln 4+2$	**2**	**A1** for each term
8(a)(i)	15 120	**B1**	
8(a)(ii)	Total: 3780	**3**	**B1**: Starts with 5, 7 or 9: 2520 soi **B1**: Starts with 6 or 8: 1260 soi
	Alternative		
	Total: 3780	**(3)**	**B1**: Ends with 2 or 4: 2100 soi **B1**: Ends with 6 or 8: 1680 soi
8(b)	2 nurses, 2 dentists, 5 doctors = 36 2 nurses, 3 dentists, 4 doctors = 60 2 nurses, 4 dentists, 3 doctors = 20	**2**	**M1** for two correct cases
	Total = 116	**A1**	
	Alternative		
	1 dentist only = 4 No nurses = 10 1 nurse only = 90	**(M1)**	
	Total = 116	**(2)**	**M1** for attempt to subtract at least 2 correct cases from 220
9(a)(i)	$d=3\lg\theta$	**B1**	
	$\frac{n}{2}\left(2(2\lg\theta)+(n-1)3\lg\theta\right)=4732\lg\theta$	**M1**	For use of the sum formula to obtain an equation in $\lg\theta$ only, using *their a* and *d* and $4732\lg\theta$
	$3n^2+n-9464=0$	**A1**	
	$n=56$ only	**2**	**M1** for attempt to solve *their* quadratic equation in *n*
9(a)(ii)	0.001 oe	**B1**	

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Question	Answer	Marks	Guidance
9(b)(i)	$r = \frac{1}{3}$ soi	**B1**	
	$\lvert r \rvert < 1$ oe, so has a sum to infinity	**B1**	**Dep** on previous **B1**
9(b)(ii)	nth term $\left(\lg \phi^3\right)\left(\frac{1}{3}\right)^{n-1}$	**B1**	
	$3^{2-n} \lg \phi$	**2**	**B1** for $(3\lg\phi)3^{1-n}$ or $\frac{3\lg\phi}{3^{n-1}}$
9(b)(iii)	10	**B1**	

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