Question	Answer	Marks	Partial Marks
9(b)	$\frac{1}{2}\log_a b - \frac{1}{2} = \frac{1}{\log_a b}$ or $\frac{\frac{1}{2}}{\log_b a} - \frac{1}{2} = \log_b a$	**B2**	**B1** for bringing down the power of $\frac{1}{2}$ e.g. $\frac{1}{2}\log_a b$ or for a change of base e.g. $\frac{1}{\log_a b}$
	Clears the fraction and rearranges $\frac{1}{2}(\log_a b)^2 - \frac{1}{2}\log_a b = 1$ oe $(\log_a b)^2 - \log_a b - 2 = 0$ oe or let $x = \log_a b$ $x^2 - x - 2 = 0$ oe or $\frac{1}{2} - \frac{1}{2}\log_b a = (\log_b a)^2$ $0 = 2(\log_b a)^2 + \log_b a - 1$ oe or let $y = \log_b a$ $2y^2 + y - 1 = 0$	**M1**	
	$(\log_a b - 2)(\log_a b + 1)$ oe or $(2\log_b a - 1)(\log_b a + 1)$	**M1**	
	[$\log_a b = 2$, $\log_a b = -1$ or $\log_b a = \frac{1}{2}$, $\log_b a = -1$ leading to] $b = a^2$, $b =$ oe	**A1**	
10(a)(i)	$4 \times (-0.5)^{19}$	**M1**	
	$-\frac{1}{131072}$ or -7.63×10^{-6} or $-7.62939... \times 10^{-6}$ rot to four or more figs	**A1**	
10(a)(ii)	Valid explanation e.g. the common ratio is between −1 and 1	**B1**	
	$\frac{4}{1-(-0.5)} = \frac{8}{3}$	**B1**	

Question	Answer	Marks	Partial Marks
10(b)(i)	$a+9d=15(a+d)$	**B1**	
	$\frac{6}{2}\{2a+5d\}=87$	**B1**	
	Solves *their* equations for d e.g. $2\left(-\frac{3}{7}d\right)+5d=29$	**M1**	
	$d=7$	**A1**	
10(b)(ii)	$a=-3$ soi	**B1**	
	$6990=their(-3)+(n-1)(their7)$	**M1**	
	$n=1000$	**A1**	
11(a)	[perimeter =] $\frac{4}{3}\pi r$ soi	**B2**	**B1** for angle $ACB=\frac{2}{3}\pi$
	$\left(their\frac{4}{3}\pi r\right)=4\pi$ oe	**M1**	
	$r=3$	**A1**	
11(b)	$\frac{1}{2}\times their3^2\times their\frac{2\pi}{3}$ oe	**M1**	
	$\frac{1}{2}\times their3^2\times\sin their\frac{2\pi}{3}$ oe	**M1**	
	For subtracting and doubling: $their3^2\times their\frac{2\pi}{3}-$ $their3^2\times\sin their\frac{2\pi}{3}$	**M1**	
	$6\pi-\frac{9}{2}\sqrt{3}$ or exact equivalent	**A1**	