13	**(a)**		3	**B1** **[1]**	**3.3**		

Question			Answer	Marks	AOs		Guidance
13	(b)		$[8\times3^4 =]$ 648	**B1** **[1]**	**1.1**		
13	(c)		$\frac{8(3^n-1)}{3-1}$ $= 4(3^n-1)$ or $-4(1-3^n)$	 **B1** **[1]**	 **3.4**	use of formula for sum of gp mark the final answer	 or $4\times3^n - 4$
13	(d)		their $4(3^n - 1) = 185\ 207$ or $3^n = 46303(.75)$ awrt 9.8 cao [=] 9	**M1** **A1** **A1** **[3]**	**3.1a** **1.1** **3.2a**	**M0** for eg $8\times3^{n-1}$ no FT available here not from wrong working	allow use of < or $\leqslant$ for up to 3 marks allow **M1** only for use of > or $\geq$ or $3^9 = 19683$ **and** $3^{10} = 59049$ seen for **M1** then **A1** (comparison with 46 303)
13	(e)		unlikely because eg some of the population will be immune to the virus eg some of the population will not be exposed to the virus eg medical intervention eg extrapolation eg movement of people in and out of town	**B1** **[1]**	**3.5b**	any sensible reason	it's unlikely that everyone will be affected oe is insufficient