5	(i)		$\log_{[10]} n = \log_{[10]} a + kt \log_{[10]} 2$ This is of form $y = mx + c$ [with $\log_{[10]} n$ as y and t as x]	**M1** **E1** **[2]**	**1.1a** **1.1**	**AG** Allow $t \log 2^k$	
5	(ii)		Reasonable line of best fit drawn (by eye) Suitable method leading to a value eg use of intercept leading to $0.9 < \log a < 1.2$ So $7.4 < a < 15.85$ Suitable method leading to k value eg $k \log_{10} 2 = \text{gradient} \approx 0.33$ k in range $0 < k < 1.25$ and a in range $7.4 < a < 15.85$	**B1** **M1** **M1** **A1** **[4]**	**1.1a** **2.2a** **1.1** **2.2a**	With $0.9 < c < 1.2$ Finding gradient of line or sub'n of t and log n	May use 2 points from line or condone use of 2 given points If gradient of exactly 1/3 used $k = 1.10730936...$
5	(iii)		$500000 = 10 \times 2^{1.1t}$ $1.1t \log 2 = \log 50000$ $t = 14.2$ $t = 14$ is 1/3/18 So 1/4/18	**M1** **A1** **M1** **A1** **[4]**	**3.4** **1.1** **3.4** **3.2a**	Correct substitution Value of t (FT their a and k) Translation into date Rounding up	For k= 1.10730936.. t=14.1 Same answer

Question			Answer	Marks	AOs	Guidance	
5	(iv)		Suitable reason e.g. The data are only for a short time scale and cannot extrapolate e.g. There will not be enough people for the growth to continue	E1 [1]	3.5b		