Question			Answer	Marks	AO	Guidance	
6	**(a)**		$\log_{10}S = \log_{10}(ab^t)$ $\log_{10}S = \log_{10}a + \log_{10}b^t$	**M1**	**2.1**	Attempt to show reduction to linear form	Introduce logs on both sides, and correctly split to the sum of two terms
			$\log_{10}S = t\log_{10}b + \log_{10}a$	**A1**	**2.1**	Obtain correct equation	Condone no base; any bases seen must be 10 A0 for $\log_{10}bt$ unless previously seen as $t\log_{10}b$
			which is of the form $Y = mX + c$	**A1**	**2.4**	Link to equation of straight line	Base of 10 must now be explicit throughout Could instead refer to a linear relationship
				[3]			
	(b)		$\log_{10}a = 0.583 \Rightarrow a = 10^{0\,583} = 3.8$	**B1**	**1.1**	Obtain $a = 3.8$, or better, from either eqn	Must clearly be value for a
			$\log_{10}b = 0.146 \Rightarrow b = 10^{0\,146} = 1.4$	**B1**	**1.1**	Obtain $b = 1.4$, or better, from either eqn	Must clearly be value for b
				[2]			
	(c)		$3.8 \times 1.4^t = 200$ $1.4^t = 52.63$	**M1**	**3.1a**	Link their model to 200 and attempt to solve for t	Or use linear equation and attempt to solve for t Must use correct solution method Allow M1 if using $S = 200,000,000$ Allow if their a and b transposed
			$t = 11.8$	**A1**	**1.1**	Obtain $t = 11.8$, or better, www (allow $t = 12$)	Condone 11.7 as truncated value for t
			so year is 2027	**A1FT**	**3.2a**	FT their value for t	Answer in context, so not just '12 years later' FT on 2015 + integer number of years, from rounding up their t
				[3]			

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	(d)		Unlikely that sales will continue at same rate Finite market **[1]**	**B1**	**3.5b**	Any sensible reason – eg pattern not necessarily continuing or the market being limited by no. of customers	Allow 'extrapolation unreliable' Reason needed not just eg 'other external factors'