

9	(a)		$m = \frac{3.58-3.93}{4-0}$ $\log_{10}V = -0.0875t + 3.93$	M1 M1 A1 [3]	1.1 3.3 1.1	(±) 0.0875 oe Allow any value for - 0.0875 condone omission of base	Condone ln
9	(b)		$V = 10^{-0.0875t + 3.93}$ $A = 10^{3.93} = 8500$ $b = 10^{-0.0875} = 0.82$	M1 A1 A1 [3]	3.1b 3.3 1.1	Or $\log V = \log A + \log b^t$ Accept $V = 8500 \times 0.82^t$	8511.38 0.81752; sc B1 if both answers not to 2 sf. Allow 8500 taken from table (M1A1)
9	(c)		3151.29 (≈ 3150) so the model is a (very) good fit	E1 [1]	3.4	Must see value from model OR find value of t (approx. 4.98) when model gives 3150	Eg 3107.93 from more accurate values.
9	(d)		$8500 \times 0.82^t = 500$ soi take logs of both sides $(t = 14.27 \text{ so})$ after 15 years	M1 M1 A1 [3]	3.1b 1.1 3.5a	Ft from (b) for M1M1 eg $\log 8500 + \log 0.82^t = \log 500$; can be implied by 15 or 14.(...)	or $\log 0.82^t = \log\left(\frac{500}{8500}\right)$