

Question		Answer	Marks	AO	Guidance	
6	(a)	$\frac{dy}{dt} = ky$	B1 [1]	3.1b		
6	(b)	$\frac{dy}{y} = kdt$ $[\ln y]_{4000}^y = k[t]_0^t$ or $\ln y = kt + c$ $\ln \frac{y}{4000} = kt$ or $\ln 4000 = 0 + c$ $y = 4000e^{kt}$	M1 M1 A1 A1 [4]	1.1a 1.1 1.1 1.1	Attempt separation of variables Correct integrals and limits Correct substitution in correct integral	
6	(c)	$4000e^{\frac{90}{365} \ln 1.06}$ $= 4057.89$	M1 A1 [2]	1.1 1.1	FT their part (ii) BC	
6	(d)	After 1 year, increased by factor 1.06 Require further increase by factor $\frac{2}{1.06}$ $e^{\frac{t}{365} \ln 1.05} = \frac{2}{1.06}$ $\frac{t}{365} \ln 1.05 = \ln \frac{2}{1.06}$ $t = \frac{365}{\ln 1.05} \times \ln \frac{2}{1.06}$ $= 4750$ Total number of days = 5115	M1 M1 A1 M1 A1 [5]	3.1b 1.1 2.1 1.1 3.2a	May be implied Attempt to form equation with 1.05 and 1.06 Correct equation Attempt to remove logs isw	OR BC