1	**(i)**	Either	Square both sides to obtain linear equation	M1	
			Obtain $x = \frac{165}{30}$ or $\frac{33}{6}$ or $\frac{11}{2}$	A1	[2]
		Or	Solve linear equation in which, initially, signs of x are different	M1	
			Obtain $x + 2 = -x + 13$ or equivalent and hence $\frac{11}{2}$ or equivalent	A1	[2]
	(ii)		Apply logarithms and use power law	M1	
			Obtain $y\log 3 = \log\frac{11}{2}$ and hence $y = 1.55$	A1	[2]
2			Use $\sin 2\theta = 2\sin\theta\cos\theta$	B1	
			Simplify to obtain form $c_1\sin^2\theta = c_2$ or equivalent	M1	
			Find at least one value of θ from equation of form $\sin\theta = k$	M1	
			Obtain 35.3° and 144.7°	A1	[4]
3	**(a)**		Integrate to obtain form $k\sin(\frac{1}{3}x + 2)$ where $k \neq 4$	M1	
			Obtain $12\sin(\frac{1}{3}x + 2)$ $(+c)$	A1	[2]
	(b)		State or imply correct y-values 2, $\sqrt{20}$, $\sqrt{68}$, $\sqrt{148}$	B1	
			Use correct formula, or equivalent, with $h = 4$ and four y-values	M1	
			Obtain 79.2	A1	[3]
4			Obtain $\frac{dx}{dt} = \frac{2}{t+1}$	B1	
			Obtain $\frac{dy}{dt} = 4e^t$	B1	
			Use $\frac{dy}{dx} = \frac{dy}{dt} / \frac{dx}{dt}$ with $t = 0$ to find gradient	M1	
			Obtain 2	A1	
			Form equation of tangent through $(0, 4)$ with numerical gradient obtained from attempt to differentiate	M1	
			Obtain $2x - y + 4 = 0$ or equivalent of required form	A1	[6]
5			State or imply $\ln y = \ln K + px\ln 2$	B1	
			Obtain at least one of $1.87 = \ln K + 1.35p\ln 2$, $3.81 = \ln K + 3.35p\ln 2$, $p\ln 2 = \frac{3.81 - 1.87}{3.35 - 1.35}$ or equivalents	B1	
			Solve equation(s) to find one constant, dependent on previous B1	M1	
			Obtain $p = 1.40$	A1	
			Substitute to attempt value of K	DM1	
			Obtain $\ln K = 0.5605$ and hence $K = 1.75$	A1	[6]

6	**(i)**	Substitute –2 and equate to zero, or divide and equate remainder to zero	M1	
		Obtain $a = 12$	A1	[2]
	(ii)	Carry out division, or equivalent, at least as far as x^2 and x terms in quotient	M1	
		Obtain $x^2 - 2x + 6$	A1	
		Calculate discriminant of a 3 term quadratic quotient (or equivalent)	DM1	
		Obtain –20 (or equivalent)	A1	
		Conclude by referring to, or implying, root –2 and no root from quadratic factor	A1	[5]
7	**(i)**	Integrate to obtain $ke^{3x} + mx^3$	M1	
		Apply both limits to obtain $\frac{1}{6}e^{3a} + \frac{1}{3}a^3 - \frac{1}{6} = 10$ or equivalent	A1	
		Rearrange to form involving natural logarithm	DM1	
		Obtain $a = \frac{1}{3}\ln(61 - 2a^3)$ with no errors seen (AG)	A1	[4]
	(ii)	Consider sign of $a - \frac{1}{3}\ln(61 - 2a^3)$ for 1.0 and 1.5 or equivalent	M1	
		Obtain –0.36 and 0.17 or equivalent and justify conclusion	A1	[2]
	(iii)	Use iteration process correctly at least once	M1	
		Obtain final answer 1.343	A1	
		Show sufficient iterations to 5 decimal places to justify answer or show a sign change in the interval (1.3425, 1.3435)	A1	[3]
8	**(i)**	Differentiate using product rule	M1	
		Obtain $\sec^2 x \cos 2x - 2\tan x \sin 2x$	A1	
		Use $\cos 2x = 2\cos^2 x - 1$ or $\sin 2x = 2\sin x \cos x$ or both	B1	
		Express derivative in terms of $\sec x$ and $\cos x$ only	M1	
		Obtain $4\cos^2 x - \sec^2 x - 2$ with no errors seen (AG)	A1	[5]
	(ii)	State $4\cos^4 x - 2\cos^2 x - 1 = 0$	B1	
		Apply quadratic formula to a 3 term quadratic equation in terms of $\cos^2 x$ to find the least positive value of $\cos^2 x$	M1	
		Obtain or imply $\cos^2 x = \dfrac{1+\sqrt{5}}{4}$ or 0.809…	A1	
		Obtain 0.45	A1	[4]