Question	Answer	Marks	Guidance
1	$a = 5$	**B1**	
	$b = 4$	**B1**	
	$c = -3$	**B1**	
2	$\tan^2\theta = \frac{1}{y+2}$ soi **or** $x = 1 + \tan^2\theta$ soi	**B1**	Must be in terms of $\tan^2\theta$
	Use of $\tan^2\theta + 1 = \sec^2\theta$ $\frac{1}{y+2} + 1 = x$ oe	**M1**	For a valid attempt to eliminate θ
	$y = \frac{1}{x-1} - 2$ or $y = \frac{3-2x}{x-1}$ oe	**2**	**Dep M1** for attempt to rearrange to obtain in the required form **A1** for a correct form
	Alternative $x = \frac{1}{\cos^2\theta}$ **and** $y + 2 = \frac{\cos^2\theta}{\sin^2\theta}$ soi	**(B1)**	
	$y + 2 = \frac{\frac{1}{x}}{1 - \frac{1}{x}}$ oe	**(M1)**	For a valid attempt to eliminate θ, making use of $\sin^2\theta + \cos^2\theta = 1$
	$y = \frac{1}{x-1} - 2$ or $y = \frac{3-2x}{x-1}$ oe	**(2)**	**Dep M1** for attempt to rearrange to obtain in the required form **A1** for a correct form
3(a)	Gradient = 4 soi	**B1**	
	Intercept = -3 soi	**B1**	
	$\lg(2y+1) = 4x^2 - 3$ oe	**M1**	For $\lg(2y+1) = \textit{their } m\left(x^2\right) + \textit{their } c$
	$y = \frac{1}{2}\left(10^{4x^2-3} - 1\right)$ or $y = \frac{\frac{10^{4x^2}}{1000} - 1}{2}$	**A1**	
3(b)	$y = 0$	**B1**	Must have at least 3 marks from part **(a)**

Question	Answer	Marks	Guidance
3(c)	$2=\frac{1}{2}\left(10^{4x^2-3}-1\right)$ oe and attempt to obtain x = …	**M1**	**Dep** on **M** mark in part **(a)** for use of $y=2$ in *their* $y=\frac{1}{2}\left(10^{4x^2-3}-1\right)$, $y=\frac{\frac{10^{4x^2}}{1000}-1}{2}$ or $\lg(2y+1)=4x^2-3$ and attempt to obtain x = …
	$x=(\pm)\,0.962$ or better	**A1**	
4(a)	$\frac{1}{17}\begin{pmatrix}-15\\8\end{pmatrix}$ oe	**2**	**B1** for 17 seen
4(b)	$2a+4b-12=4b-4a$ $-5+3=4a+8b$	**M1**	For equating like vectors to obtain at least one equation
	$a=2,\ b=-\frac{5}{4}$ oe	**2**	**Dep M** mark for solving *their* 2 equations to obtain both a and b
5	$\left(1+\frac{x}{6}\right)^{12}=1+2x+\frac{11x^2}{6}$	**2**	**B2** for 3 correct terms **B1** for 2 correct terms
	$(2-3x)^3=8-36x+54x^2...$	**2**	**B2** for 3 correct terms **B1** for 2 correct terms
	Term in x: $-36x+16x$	**M1**	A correct method using *their* terms or coefficients, must be considering 2 terms
	$p=-20$ soi	**A1**	
	Term in x^2: $\frac{88}{6}x^2+54x^2-72x^2$	**M1**	A correct method using *their* terms or coefficients, must be considering 3 terms
	$q=-\frac{10}{3}$ soi	**A1**	
6(a)	$\mathrm{p}\left(\frac{1}{2}\right)$: $a+4b+15=0$ oe	**B1**	For $\mathrm{p}\left(\frac{1}{2}\right)$ equated to zero
	$\mathrm{p}(2)$: $4a+b=60$ oe	**B1**	For $\mathrm{p}(2)$ equated to 120
	$a=17,\ b=-8$	**2**	**Dep M1** on both previous **B** marks, for solving *their* equations to obtain a and b **A1** for both