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

Question	Answer	Marks	Guidance
6(b)	-8	**B1**	**FT** on *their* **integer** b
6(c)	$\mathrm{p}'(x) = 18x^2 + 34x + 6$ $\mathrm{p}''(x) = 36x + 34$	**M1**	For attempt to differentiate *their* p(x), may be implied by correct **FT** answer
	$\mathrm{p}''(0) = 34$	**A1**	**FT** on $2\times$ *their* **integer** a
7(a)	$\dfrac{2(x-1)^2 - (x-1)(2x+3) + (2x+3)}{(x-1)^2(2x+3)}$	**M1**	Attempt at a fraction, allow with an extra $(x-1)$ term in each term of the numerator and the denominator
	$= \dfrac{8-3x}{(x-1)^2(2x+3)}$	**A1**	**AG** – must see sufficient detail to justify the given result, if an extra $(x-1)$ term involved, it must be dealt with correctly
7(b)	$\left[\ln(2x+3) - \ln(x-1) - \dfrac{1}{(x-1)}\right]_2^a$	**3**	**B1** for each correct term
	$\left(\ln(2a+3) - \ln(a-1) - \dfrac{1}{a-1}\right) - (\ln 7 - 1)$	**M1**	**Dep** on at least one ln term from integration, for applying limits correctly in *their* integral
	$\dfrac{a-2}{a-1} + \ln\left(\dfrac{2a+3}{7(a-1)}\right)$ oe	**2**	**A1** for $\dfrac{a-2}{a-1}$ or $1 - \dfrac{1}{a-1}$ **A1** for $\ln\left(\dfrac{2a+3}{7(a-1)}\right)$
	Alternative 1 final 2 marks $\dfrac{-1}{a-1} + \ln\left(\dfrac{\mathrm{e}(2a+3)}{7(a-1)}\right)$ oe	**(2)**	**A1** for $\dfrac{-1}{a-1}$ **A1** for $\ln\left(\dfrac{\mathrm{e}(2a+3)}{7(a-1)}\right)$
	Alternative 2 final 2 marks $\dfrac{a-2}{a-1} - \ln 7 + \ln\left(\dfrac{2a+3}{(a-1)}\right)$ oe	**(2)**	**A1** for $\dfrac{a-2}{a-1} - \ln 7$ or $1 - \dfrac{1}{a-1} - \ln 7$ Allow 1.946 or better for ln 7 **A1** for $\ln\left(\dfrac{2a+3}{(a-1)}\right)$