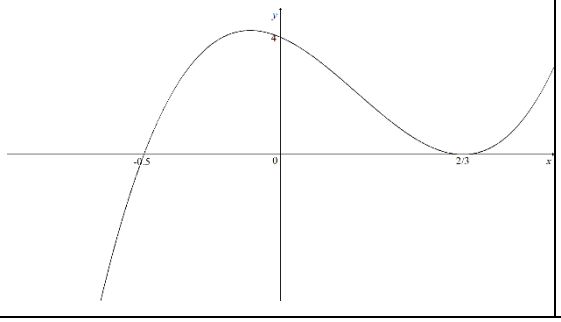
Question	Answer	Marks	Guidance
6(b)	$\log_4 a = \dfrac{1}{\log_a 4}$	**B1**	
	$2(\log_a 4)^2 - 5\log_a 4 - 3 = 0$	**M1**	For attempt to obtain a 3-term quadratic equation in $\log_a 4$ and an attempt to solve to obtain $\log_a 4 = ...$
	$\log_a 4 = -\dfrac{1}{2}$, $\log_a 4 = 3$ $a = \dfrac{1}{16}$, $a = 4^{\frac{1}{3}}$ oe	**3**	**M1 Dep** for dealing with logarithms correctly at least once, to obtain $a = \ldots$ **A1** for each correct solution nfww.
	Alternative:		
	$\log_a 4 = \dfrac{1}{\log_4 a}$	**(B1)**	
	$3(\log_4 a)^2 + 5\log_4 a - 2 = 0$	**(M1)**	For attempt to obtain a 3-term quadratic equation in $\log_a 4$ and an attempt to solve to obtain $\log_a 4 = ...$
	$\log_4 a = -2$, $3\log_4 a = 1$ $a = \dfrac{1}{16}$, $a = 4^{\frac{1}{3}}$ oe	**(3)**	**M1 Dep** for dealing with logarithms correctly at least once, to obtain $a = \ldots$ **A1** for each correct solution nfww.
7(a)	$\dfrac{dy}{dx} = 2\times 3\times (2x+1)(3x-2) + 2(3x-2)^2$	**2**	**M1** for attempt at differentiation of a product, allow one arithmetic error. **A1** all correct, allow unsimplified.
	$2(3x-2)(9x+1)$	**A1**	
7(b)	$\left(\dfrac{2}{3},\ 0\right)$	**B1**	Must be from a correct derivative
	$\left(-\dfrac{1}{9},\ \dfrac{343}{81}\right)$ or $\left(-\dfrac{1}{9},\ 4.23\right)$	**B1**	
7(c)		**3**	**B1** for a correct cubic shape with a maximum in the second quadrant. **B1** for $-\dfrac{1}{2}$ and $\dfrac{2}{3}$, must have a cubic shape **B1** for 4 must have a cubic shape

Question	Answer	Marks	Guidance
7(d)	$0 < k < \frac{343}{81}$ or $0 < k < 4.23$	**2**	**B1** for critical values 0 and *their* 4.23 or $\frac{343}{81}$
8	$4x^2 - 6x - 5 = 1 - 4x$ oe $2x^2 - x - 3 = 0$ oe	**2**	**M1** for attempt to eliminate *y* and simplify to a 3-term quadratic equation = 0. **A1** for a correct equation.
	Correct attempt to solve *their* quadratic equation to obtain 2 values for *x* or for *y*	**M1**	
	$x = -1, \quad \frac{3}{2}$	**A1**	
	$y = 5, \quad -5$	**A1**	
	$\frac{dy}{dx} = 8x - 6$ When $x = \frac{3}{2}$, $\frac{dy}{dx} = 6$	**M1**	For finding the value of $\frac{dy}{dx}$ using *their* $x = \frac{3}{2}$
	Equation of tangent: $y = 6x - 14$	**2**	**Dep M1** for attempt to find the equation of the tangent using *their* $x = \frac{3}{2}$ and *their* $y = -5$. **A1** allow unsimplified.
	$5 = 6x - 14$ oe	**M1**	For use of *their* $y = 5$ in *their* tangent equation
	$x = 3.17$	**A1**	
9(a)(i)	$-3\tan\frac{\theta}{2} + 11\left(2\tan\frac{\theta}{2}\right) = \frac{19\sqrt{3}}{3}$	**2**	**M1** for use of 12th term with *their* common difference. **A1** allow unsimplified.
	$\tan\frac{\theta}{2} = \frac{\sqrt{3}}{3}$ $\theta = \frac{\pi}{3}$	**2**	**Dep M1** for correct attempt to solve *their* $\tan\frac{\theta}{2} = \frac{\sqrt{3}}{3}$
9(a)(ii)	$\frac{10}{2}\left(2\left(-3\times\frac{\sqrt{3}}{3}\right) + 9\left(2\times\frac{\sqrt{3}}{3}\right)\right)$ oe	**M1**	For the use of the sum to 10 terms using *their* $\tan\frac{\theta}{2} = \frac{\sqrt{3}}{3}$
	$20\sqrt{3}$	**A1**	