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**	

Question	Answer	Marks	Guidance
9(b)(i)	Common ratio = $4\sin^2\phi$	**B1**	
	$1+4\sin^2\phi=4$	**M1**	For use of $1+$*their* $r=4$
	$\sin\phi=\pm\frac{\sqrt{3}}{2}$ $\phi=\pm\frac{\pi}{3}$	**2**	**M1** for a correct attempt to solve *their* $\sin\phi=\pm\frac{\sqrt{3}}{2}$ to obtain at least one solution.
9(b)(ii)	Common ratio = 3 soi	**M1**	For attempt to find numerical value of *their* common ratio.
	$3>1$ so no sum to infinity [as $-1<r<1$ to have a sum to infinity.] oe	**A1**	Must have correct common ratio.
10(a)	$\frac{(x-4)\left(\frac{1}{2}\times 6x\left(3x^2-2\right)^{-\frac{1}{2}}\right)-\left(3x^2-2\right)^{\frac{1}{2}}}{(x-4)^2}$	**3**	**B1** for $\frac{1}{2}\times 6x\left(3x^2-2\right)^{-\frac{1}{2}}$, allow unsimplified. **M1** for a correct attempt to differentiate a quotient. **A1** for all other terms correct.
	$\frac{\left(3x^2-2\right)^{-\frac{1}{2}}}{(x-4)^2}\left(3x(x-4)-\left(3x^2-2\right)\right)$	**M1**	For a correct attempt to simplify to obtain the given form.
	$\frac{-12x+2}{\sqrt{3x^2-2}(x-4)^2}$	**A1**	
10(b)	When $x=3$, $\frac{dy}{dx}=\frac{-36+2}{5}$	**M1**	For attempt using *their* $\frac{dy}{dx}$
	$-6.8h$	**2**	**Dep M1** for attempt at small changes using their -6.8. **A1** cao