Question Number	Scheme	Notes	Marks
2(i)	Throughout both parts of this question do not penalise omission of $\mathrm{d}x$ or $\mathrm{d}\theta$		
	$5+4x-x^2=9-(x-2)^2$ oe	Correct completion of the square Any correct result	B1
	$\int \frac{1}{\sqrt{5+4x-x^2}}\,\mathrm{d}x=\int \frac{1}{\sqrt{9-(x-2)^2}}\,\mathrm{d}x=\sin^{-1}\left(\frac{x-2}{3}\right)(+c)$ M1: Obtains $k\sin^{-1}\mathrm{f}(x)$ A1: Correct integration (+ c not needed)		M1A1
			(3)
(ii)	$x=6\Rightarrow\theta=\frac{\pi}{3}$ $x=2\sqrt{3}\Rightarrow\theta=\frac{\pi}{6}$	Correct θ limits in radians	B1
	$\int \frac{18}{(x^2-9)^{\frac{3}{2}}}\,\mathrm{d}x=\int \frac{18\times 3\sec\theta\tan\theta}{(9\sec^2\theta-9)^{\frac{3}{2}}}\,\mathrm{d}\theta$ M1: For $\int \frac{18}{((3\sec\theta)^2-9)^{\frac{3}{2}}}\times\left(\text{their}\,\frac{\mathrm{d}x}{\mathrm{d}\theta}\right)\mathrm{d}\theta$		M1
	$\int \frac{54\sec\theta\tan\theta}{(9\sec^2\theta-9)^{\frac{3}{2}}}\,\mathrm{d}\theta=54\int \frac{\sec\theta\tan\theta}{27\tan^3\theta}\,\mathrm{d}\theta=2\int \frac{\sin\theta\cos^3\theta}{\cos^2\theta\sin^3\theta}\,\mathrm{d}\theta$ $2\int \frac{\cos\theta}{\sin^2\theta}\,\mathrm{d}\theta$ oe eg $2\int \frac{\sec\theta}{\tan^2\theta}\,\mathrm{d}\theta$ Correct simplified integral		A1
	$2\int \frac{\cos\theta}{\sin^2\theta}\,\mathrm{d}\theta=2\int \mathrm{cosec}\,\theta\cot\theta\,\mathrm{d}\theta=-2\mathrm{cosec}\,\theta(+c)$ Obtains $k\mathrm{cosec}\,\theta(+c)$		M1
	$\left[-2\mathrm{cosec}\,\theta\right]_{\frac{\pi}{6}}^{\frac{\pi}{3}}=-2\mathrm{cosec}\frac{\pi}{3}+2\mathrm{cosec}\frac{\pi}{6}$	Uses changed limits correctly. **Depends on all previous method marks**.	**d**M1
	$=4-\frac{4}{3}\sqrt{3}$	Cao Allow these 2 marks if limits have been given in degrees	A1
			(6)
			Total 9

ALT	For B1 and final dM1A1 of (ii)	
	dM1: Reverse the substitution A1: Correct reversed result A1: **enter as B1 on e-PEN** Correct final answer	