Question			Answer	Marks	AO	Guidance	
7	(a)		$u = x^2 + 1$ $\mathrm{d}u = 2x\mathrm{d}x$	**M1**	**1.1a**	Attempt a substitution of x and $\mathrm{d}x$	**M0** for $\mathrm{d}u = \mathrm{d}x$
			$\frac{5}{2}\int (u-1)u^{\frac{1}{2}}\mathrm{d}u$	**M1**	**1.1**	Replace as far as $k\int (u-1)u^{\frac{1}{2}}du$	
			$\frac{5}{2}\int \left(u^{\frac{3}{2}} - u^{\frac{1}{2}}\right)\mathrm{d}u$	**A1**	**1.1**		
			$u^{\frac{5}{2}} - \frac{5}{3}u^{\frac{3}{2}} + c$	**M1**	**1.1**	Integrate their integral if in u	
			$\left(x^2+1\right)^{\frac{5}{2}} - \frac{5}{3}\left(x^2+1\right)^{\frac{3}{2}} + c$	**A1**	**1.1**	Do not condone missing $+c$ in both **(a)** and **(b)**	
				[5]			
7	(b)		$\int \tan^2\theta\mathrm{d}\theta = \int \left(\sec^2\theta - 1\right)\mathrm{d}\theta$	**M1**	**1.1**	Award for sight of the intermediate result	**OR** **M1** $\int \theta\tan^2\theta\mathrm{d}\theta = \int \theta\left(\sec^2\theta - 1\right)\mathrm{d}\theta$
			$= \tan\theta - \theta$	**A1**	**1.1**		**A1** $= \int \theta\sec^2\theta\,\mathrm{d}\theta - \int \theta\,\mathrm{d}\theta$
			$u = \theta, \mathrm{d}v = \tan^2\theta$	**M1**	**3.1a**	Recognise integration by parts with appropriate choice of u and $\mathrm{d}v$	**M1** $u = \theta,\ dv = \sec^2\theta$
			So $\int \theta\tan^2\theta\mathrm{d}\theta = \theta(\tan\theta - \theta) - \int(\tan\theta - \theta)\mathrm{d}\theta$	**A1**	**1.1**	Obtain correct intermediate result	**A1** So $\int \theta\tan^2\theta\mathrm{d}\theta$ $= \theta\tan\theta - \int \tan\theta\mathrm{d}\theta - \frac{1}{2}\theta^2$
			$-\frac{1}{2}\theta^2 + \theta\tan\theta - \ln\left\lvert\sec\theta\right\rvert + c$	**A1**	**1.1**		**A1** $= -\frac{1}{2}\theta^2 + \theta\tan\theta - \ln\left\lvert\sec\theta\right\rvert + c$
				[5]			