Q	Marking instructions	AO	Marks	Typical solution
7	Differentiates the substitution to obtain $\frac{\mathrm{d}u}{\mathrm{d}x}=\frac{1}{2}x^{-\frac{1}{2}}$ or $\frac{\mathrm{d}x}{\mathrm{d}u}=2(u-1)$ **OE**	3.1a	B1	$\frac{\mathrm{d}u}{\mathrm{d}x}=\frac{1}{2}x^{-\frac{1}{2}}$ $\Rightarrow \mathrm{d}x=2\sqrt{x}\mathrm{d}u$ $=2(u-1)\mathrm{d}u$ $\int\frac{1}{u}\,2(u-1)\mathrm{d}u$ $=\int 2-\frac{2}{u}\,\mathrm{d}u$ $=2u-2\ln u+c$ $=2(1+\sqrt{x})-2\ln\left(1+\sqrt{x}\right)+c$
	Completes substitution to obtain an integrand which could be simplified to $\int A+\frac{B}{u}\,\mathrm{d}u$ where A and B are non-zero constants	1.1a	M1	
	Obtains $Cu+D\ln u$ where C and D are non-zero constants	1.1a	M1	
	Obtains $2u-2\ln u$ **OE**	1.1b	A1	
	Obtains $2(1+\sqrt{x})-2\ln(1+\sqrt{x})+c$ or $2+2\sqrt{x}-2\ln(1+\sqrt{x})+2c$ or $2\sqrt{x}-2\ln(1+\sqrt{x})+k$ **OE ISW**	1.1b	A1	
	Question 7 Total		**5**	