Question			Answer	Marks	AO	Guidance	
4	(a)		**DR** $2x + 1 = \ln\frac{7}{5}$	**M1**	**2.1**	Dividing by 5 then taking logs of both sides to obtain a linear equation	Could be logs to any base but must also drop power eg $(2x + 1)\lg(e) = \lg(1.4)$ Condone invisible brackets as long as later implied If taking logs of the original equation the LHS must be a sum eg $\ln 5 + (2x + 1)$
			$x = \frac{1}{2}\left(\ln\frac{7}{5} - 1\right) = -0.332$	**A1**	**1.1**	Accept any exact answer, or a decimal equivalent If more than 3sf used then accept $[-0.3315, -0.332]$	**ISW** once correct answer has been seen Exact answer could be unsimplified (and could include eg $\lg(e)$) May see $\ln 7 - \ln 5$ in place of $\ln\frac{7}{5}$
				[2]			**DR** so some method must be seen to gain any credit
4	(b)		**DR** $3\log_{10}x = \log_{10}x^3$	**B1**	**3.1a**	Use the power law correctly on $3\log_{10}x$	Seen anywhere in solution, and possibly in an incorrect equation Condone no explicit base
			$\log_{10}\left(2x^3 + 27\right) - \log_{10}x^3$ $= \log_{10}\frac{2x^3 + 27}{x^3}$	**M1***	**2.1**	Correctly combine at least two correct log terms	Most likely to rearrange to get both log terms on one side of the equation and then combine but could also use $1 = \log_{10}10$ and combine with other log term(s) Condone no explicit base
			$\frac{2x^3+27}{x^3} = 10$	**M1dep***	**1.1**	Correctly remove logs to obtain correct equation	Dependent on correct combination of logs
			$x^3 = \frac{27}{8}$	**A1**	**1.1**	Obtain $x = \frac{3}{2}$ or $= 1.5$	**A0** if cube root has not been evaluated eg $\sqrt[3]{3.375}$
			$x = \frac{3}{2}$				**DR** so some method required; if answer only then allow **SC B1** for correct answer

Question			Answer	Marks	AO	Guidance	
			Alternative method **Removing $\log_{10}$ as first step**				
			$2x^3 + 27 = 10^{1+3\log x}$ $2x^3 + 27 = 10^{1+\log x^3}$	**B1**		Use the power law correctly on $3\log_{10}x$	Seen anywhere in solution, and possibly in an incorrect equation Condone no explicit base
			$2x^3 + 27 = 10^1 \times 10^{\log x^3}$	**M1***		Correctly split $10^{1+\log x^3}$ or $10^{1+3\log x}$	Must be product not sum
			$2x^3 + 27 = 10x^3$	**M1dep***		Correctly remove logs to obtain correct equation	Dependent on correct splitting of indices
			$x^3 = \frac{27}{8}$ $x = \frac{3}{2}$	**A1**		Obtain $x = \frac{3}{2}$ or $= 1.5$	**A0** if cube root has not been evaluated eg $\sqrt[3]{3.375}$
				[4]			**DR** so some method required; if answer only then allow **SC B1** for correct answer