

Q	Marking Instructions	AO	Marks	Typical Solution
4	<p>Uses a law of logarithms correctly in their working from the list below:</p> <p>Multiplication / Division / Power</p> <p>NB Any attempt to show the result with numerical values scores 0/4</p>	1.1a	M1	$\log_{10} \frac{x^4}{100} + \log_{10} 9x - \log_{10} x^3$ $= 4\log_{10} x - \log_{10} 100$ $+ \log_{10} 9 + \log_{10} x$ $- 3\log_{10} x$ $= -2\log_{10} 10 + 2\log_{10} 3 + 2\log_{10} x$
	<p>Uses a different law of logarithms correctly from above list</p> <p>NB $\log_{10} \frac{9x^2}{100}$ OE scores M1 M1</p>	1.1a	M1	$= 2(-\log_{10} 10 + \log_{10} 3 + \log_{10} x)$ $= 2(-1 + \log_{10} 3x)$
	<p>Obtains at least two terms equivalent to</p> $-2\log_{10} 10 + 2\log_{10} 3 + 2\log_{10} x$	1.1b	A1	
	<p>Completes rigorous argument with no slips to obtain $2(-1 + \log_{10} 3x)$ correctly with Base 10 identified in the final answer</p> <p>AG</p>	2.1	R1	
	Total		4	