Question	Scheme		Marks	AOs
9 (a)	$\log_{10} y = \frac{2}{3}\log_{10} x - 1$ $\log_{10} y = \log_{10} x^{\frac{2}{3}} - 1$	$y = p\,x^q$ $\log_{10} y = \log_{10} p + \log_{10} x^q$	M1	1.1b
	$\log_{10} y = \log_{10} x^{\frac{2}{3}} - \log_{10} 10$	$\log_{10} y = \log_{10} p + q\log_{10} x$	A1	2.5
	$\log_{10} y = \log_{10} \frac{x^{\frac{2}{3}}}{10}$	States $\log_{10} p = -1$ and $q = \frac{2}{3}$	M1	1.1b
	$y = \frac{1}{10} x^{\frac{2}{3}}$		A1	2.1
			(4)	
(b)	Attempts $y = \frac{1}{10} \times 100^{\frac{2}{3}}$ OR attempts $\log_{10} y = \frac{2}{3}\log_{10} 100 - 1 \Rightarrow$		M1	1.1b
	$y = 10^{\frac{1}{3}}$		A1	1.1b
			(2)	
				(6 marks)

Notes:

(a)

M1: For the application of one correct rule

Starting from $\log_{10} y = \frac{2}{3}\log_{10} x - 1$ look for

$\frac{2}{3}\log_{10} x \to \log_{10} x^{\frac{2}{3}}$, $-1 \to -\log_{10} 10$ or $y = 10^{\frac{2}{3}\log_{10} x - 1}$ o.e.

Staring form $y = p\,x^q$ look for work proceeding to $\log_{10} y = \log_{10} p + \log_{10} x^q$

This may be implied by one correct equation for either *p* or *q*

A1: Correct intermediate equation showing two correct applications of log rules

This may be implied by one correct value for either *p* or *q*

M1: Full method showing how $\log_{10} y = \frac{2}{3}\log_{10} x - 1$ can be written in the form $\log_{10} y = \log_{10}\left(px^q\right)$

Or else how $y = px^q$ can be written in the form $\log_{10} y = \frac{2}{3}\log_{10} x - 1$ with both constants p and q compared correctly.

This may be implied by correct equations for both *p* and *q*

A1: Full and complete proof with no errors leading to correct equation $y = \frac{1}{10} x^{\frac{2}{3}}$

Note that it is possible to get correct values for p and q but not score all 4 marks due to the "proof" element here

(b)

M1: Substitutes $x = 100$ into either equation with an attempt to find y or $\log_{10} y$

A1: Presents the solution in the required form $y = 10^{\frac{1}{3}}$