

Question number	Scheme	Marks
7	$\frac{\log_7 x^2}{\log_7 49}$ $\log_7 \left(\frac{8x^2 - 6x + 3}{x} \right), \log_7 2^3$ $\frac{8x^2 - 6x + 3}{x} = 2^3$ $8x^2 - 14x + 3 = 0$ $(4x - 1)(2x - 3) = 0$ $x = \frac{1}{4}, \frac{3}{2}$	B1 M1 A1 M1 A1 [5]

Mark	Additional Guidance	
B1	For changing the base of the log either to base 7 or base 49	
	$\log_{49} x^2 = \frac{\log_7 x^2}{\log_7 49} = \frac{\log_7 x^2}{2}$ OR $\log_{49} x^2 = \frac{2 \log_7 x}{\log_7 49} = \log_7 x$	$\log_7 (8x^2 - 6x + 3) = \frac{\log_{49} (8x^2 - 6x + 3)}{\log_{49} 7}$ $= 2 \log_{49} (8x^2 - 6x + 3)$ AND $\log_7 2 = \frac{\log_{49} 2}{\log_{49} 7} = 2 \log_{49} 2$
M1	For combining the LHS together into one log and dealing with the powers on both sides	
	$\left[\frac{1}{2} \log_7 x^2 = \log_7 x \right] \Rightarrow$ $\log_7 \left(\frac{8x^2 - 6x + 3}{x} \right), \log_7 2^3$	$\log_{49} \left(\frac{[8x^2 - 6x + 3]^2}{x^2} \right), \log_{49} 2^6$
dM1	For forming a 3TQ with their expressions which must have come from an acceptable attempt to deal with the logs This is an A mark in Epen	
	$8x^2 - 14x + 3 = 0$	$(8x^2 - 6x + 3)^2 = 64x^2 \Rightarrow$ $8x^2 - 6x + 3 = \pm 8x \Rightarrow 8x^2 - 14x + 3 = 0$ If this method is used they must reject the negative root of $64x^2$ (i.e. $-8x$) because it will form a quadratic equation with no real roots. $\{8x^2 + 2x + 3 = 0 \Rightarrow b^2 - 4ac = -92\}$
dM1	For attempting to solve their 3TQ $8x^2 - 14x + 3 = (4x - 1)(2x - 3) = 0 \Rightarrow x = \dots, \dots$	
A1	$x = \frac{3}{2}, \frac{1}{4}$	