

Question number	Scheme								Marks
6 a	0	0.25	0.5	1	1.5	2	3		B2 (2)
	4(.00)	3.34	2.82	2.1(0)	1.67	1.41	1.15		
b	Points plotted within half a square Points joined with a smooth curve								B1 ft B1 ft (2)
c	$x = e^{-x} \Rightarrow 3x + 1 = 1 + 3e^{-x}$ or sight of $y = 3x + 1$ and $y = 1 + 3e^{-x}$ $y = 3x + 1$ drawn. Intersection is at $x = 0.5$ or 0.6								M1 M1 A1 (3)
d	$\ln(x - 1)^3 = -3x \Rightarrow \ln(x - 1) = -x$ $\Rightarrow 3x - 3 = 3e^{-x} \Rightarrow 3x - 2 = 1 + 3e^{-x}$ $y = 3x - 2$ drawn. Intersection is at $x = 1.2$ or 1.3								M1 M1 M1 A1 (4)
ALT – first 2 marks	$(x - 1)^3 = e^{-3x} \Rightarrow \left(\sqrt[3]{(x - 1)^3} = \sqrt[3]{e^{-3x}}\right) \Rightarrow x - 1 = e^{-x}$								M1
	$3x - 3 = 3e^{-x} \Rightarrow 3x - 2 = 1 + 3e^{-x}$								M1
Total 11 marks									

Part	Marks	Notes
(a)	B2	B2 for all 3 values correct (condone 2.1 for 2.10) (B1 for 2 values correct)
(b)	B1ft	For all of the points plotted within half a square, allow use of their values. Points must be checked carefully, including using the zoom tool on ePen if necessary.
	B1ft	For all of their points joined with a smooth curve. Be cautious to not award this mark if straight lines are drawn between the points plotted.
(c)	M1	For multiplying both sides by 3 and adding 1 to both sides or sight of $y = 3x + 1$
	M1	For $y = 3x + 1$ drawn – the line must intersect the curve and pass through a minimum of 2 correct points – eg (0, 1) and (1, 4) M1 M1 if the correct straight line is drawn, without working.
	A1	$x = 0.5$ or 0.6
(d)	M1	For use of $\log_a x^k = k \log_a x$ and simplifying to give the expression shown in the scheme.
	M1	For removing logs, multiplying both sides by 3 and subtracting 2 to give the expression shown. Award M1 M1 if $y = 3x - 2$ or any equivalent form is seen eg $y = 1 + 3(x - 1)$
	M1	$y = 3x - 2$ drawn – the line must intersect the curve and pass through a minimum of 2 correct points M1 M1 M1 if the correct straight line is drawn, without working.
	A1	$x = 1.2$ or 1.3
	M1	For removing logs and cube rooting each side to arrive at the expression shown in the scheme.
	M1	For multiplying by 3 and subtracting 2 to give the expression shown Award M1 M1 if $y = 3x - 2$ or any equivalent form is seen eg $y = 1 + 3(x - 1)$
ALT first 2 marks		

