Question	Answer	Marks	AO	Guidance
16	$\int \frac{dy}{y} = \int \frac{9dx}{(x-1)(x+2)}$ **oe**	**M1**	**3.1a**	separation of variables; condone omission of integral signs **or** of dx and/or dy; allow 1 slip such as omission of 9 or sign error in bracket
	$\frac{A}{x-1} + \frac{B}{x+2}$	**M1**	**3.1a**	allow 1 sign error in bracket
	$\frac{9}{(x-1)(x+2)} = \frac{3}{(x-1)} - \frac{3}{(x+2)}$ **oe**	**A1**	**1.1**	one of two terms correct
		A1	**1.1**	all correct
	$\ln y = A\ln(x-1) + B\ln(x+2) + c$	**M1***	**2.1**	any ln integral correct; **FT** their A and B; condone omission of + c
	$\ln y = 3\ln(x-1) - 3\ln(x+2) + c$ **oe**	**A1**	**1.1**	all three terms correct including + c; may see $\frac{1}{9}\ln y = \frac{1}{3}\ln(x-1) - \frac{1}{3}\ln(x+2) + c$ **NB** $\ln y + c$ is equivalent to $\ln Ay$ where A is a constant
	$\ln 16 = 3\ln(2-1) - 3\ln(2+2) + c$	**M1dep***	**2.1**	substitution of (2, 16) in their expression; may be implied by eg $\ln 16 = 3\ln 1 - 3\ln 4 + c$; must see substitution for incorrect expressions
	$c = 5\ln 4$ **or** $\ln 4^5$ **or** $\ln 1024$	**A1**	**1.1**	may see $c = \frac{5}{9}\ln 4$ **oe** allow exact equivalents only
	$\ln \frac{\text{their}1024(x-1)^A}{(x+2)^B}$ **oe**	**M1**	**3.1a**	correctly combines their RHS into a single logarithm; their + c must be correctly incorporated into their $\ln f(y)$ or their $\ln f(x)$
	$\ln y = \ln \frac{1024(x-1)^3}{(x+2)^3}$	**A1**	**1.1**	all correct

Question	Answer	Marks	AO	Guidance
	$e^{\ln y} = e^{\ln \frac{A(x-1)^3}{(x+2)^3}}$ **oe**	**M1**	**2.1**	correctly exponentiates their expressions, may be awarded before combination into single logarithm
	$y = \frac{1024(x-1)^3}{(x+2)^3}$	**A1**	**3.2a**	all correct; must see "$y =$" at some stage
		12		
	Alternatively, for the last 6 marks			
	$\ln\left\{\frac{(x-1)^A}{(x+2)^B} \times e^C\right\}$ **oe**	**M1dep***		correctly combines their RHS into a single logarithm;
	$\ln y = \ln\left[\frac{(x-1)^3}{(x+2)^3} \times e^C\right]$ **oe**	**A1**		all correct
	$e^{\ln y} = e^{\ln \frac{(x-1)^A}{(x+2)^B} \times D}$ **oe**	**M1**		correctly exponentiates their expressions; may be awarded before combining into single logarithm
	$y = \frac{(x-1)^3}{(x+2)^3} \times D$	**A1**		all correct
	$16 = \frac{(2-1)^A}{(2+2)^B} \times D$ **oe**	**M1**		substitution of (2, 16) in their expression; may be implied by eg $16 = \frac{1^3}{4^3} \times D$; must see substitution for incorrect expressions; may be awarded before exponentiating
	$y = \frac{1024(x-1)^3}{(x+2)^3}$	**A1**		all correct; must see "$y =$" at some stage