

Question	Answer	Marks	Guidance
(a)	State or imply the form $\frac{A}{3x-1} + \frac{Bx+C}{x^2+3}$	<b>B1</b>	
	Use a correct method for finding a constant	<b>M1</b>	
	Obtain one of $A = 1$ , $B = 0$ and $C = 3$ from correct working	<b>A1</b>	A maximum of M1 A1 is available after B0.
	Obtain a second value from correct working	<b>A1</b>	
	Obtain the third value from correct working	<b>A1</b>	
		<b>5</b>	
(b)	Integrate and obtain term $\frac{1}{3} \ln(3x-1)$	<b>B1 FT</b>	OE e.g. $\frac{1}{3} \ln(x - \frac{1}{3})$ . The FT is on the value of $A$ .
	Obtain term of the form $k \tan^{-1} \left( \frac{x}{\sqrt{3}} \right)$	<b>M</b>	
	Obtain term $\sqrt{3} \tan^{-1} \left( \frac{x}{\sqrt{3}} \right)$	<b>A1 FT</b>	OE. The FT is on the value of $C$ .
	Substitute correct limits in an integral of the form $a \ln(3x-1) + k \tan^{-1} \left( \frac{x}{\sqrt{3}} \right)$ , where $ak \neq 0$ , and evaluate trigonometry	<b>M1</b>	Must be subtracted the right way round. $\left( \frac{1}{3} \ln 8 - \frac{1}{3} \ln 2 + \sqrt{3} \times \frac{\pi}{3} - \sqrt{3} \times \frac{\pi}{6} \right)$ Angles should be in radians. Condone angles as decimals.
	Obtain answer $\frac{2}{3} \ln 2 + \frac{\sqrt{3}\pi}{6}$ from correct working in part <b>8(b)</b>	<b>A1</b>	Or exact 2-term equivalent e.g. $\frac{1}{3} \ln 4 + \frac{\pi}{2\sqrt{3}}$ ISW.
		<b>5</b>	