

Q	Marking instructions	AO	Marks	Typical solution
8(a)	Uses a suitable method and finds a value for A or B. eg rearranges and substitutes values or compares coefficients or uses cover-up method or uses inspection PI by $A = 1$ or $B = -1$	1.1a	M1	$x = A(2x+1) + B(x+1)$ $x = -1 \Rightarrow -1 = -A$ $A = 1$ $x = -\frac{1}{2} \Rightarrow -\frac{1}{2} = \frac{1}{2}B$ $B = -1$
	Obtains $A = 1$ Allow if seen in $\frac{1}{x+1}$	1.1b	A1	
	Obtains $B = -1$ Allow if seen in $\frac{-1}{2x+1}$	1.1b	A1	
	Subtotal		3	

Q	Marking instructions	AO	Marks	Typical solution
8(b)	Uses partial fractions with their A and B to obtain $A\ln(x+1)$ or $\frac{B}{2}\ln(2x+1)$ OE Condone B rather than $\frac{B}{2}$ Condone missing bracket or sign error of A or B	1.1a	M1	$\int_0^4 \frac{x}{2x^2+3x+1} dx = \int_0^4 \frac{1}{x+1} - \frac{1}{2x+1} dx$ $= \left[\ln(x+1) - \frac{1}{2} \ln(2x+1) \right]_0^4$ $= \ln 5 - \frac{1}{2} \ln 9 - \left(\ln 1 - \frac{1}{2} \ln 1 \right)$ $= \ln 5 - \ln 3$ $= \ln \frac{5}{3}$
	Obtains $\ln(x+1) - \frac{1}{2} \ln(2x+1)$ OE	1.1b	A1	
	Substitutes both limits correctly into their integrated expression of two $\ln$ terms (the subtraction does not need to be seen) Condone 0 for $\left(\ln 1 - \frac{1}{2} \ln 1 \right)$	1.1a	M1	
	Completes reasoned argument to obtain $\ln \frac{5}{3}$ Allow unsimplified fraction or correct recurring decimal for $\frac{5}{3}$ CSO	2.1	R1	
	Subtotal		4	
	Question 8 Total		7	