

$$\int_0^1 \frac{2}{2x^2+3x+1} dx$$

$$2x^2+3x+1 \\ = (2x+1)(x+1)$$

$$\text{Let } \frac{2}{2x^2+3x+1} = \frac{A}{2x+1} + \frac{B}{x+1} \quad \int \frac{2}{(2x+1)(x+1)}$$

$$\Rightarrow 2 = A(x+1) + B(2x+1)$$

$$\text{Take } x=-1: \quad 2 = \dots \quad \Rightarrow B =$$

$$\text{Take } x=-\frac{1}{2}: \quad 2 = \dots \quad \Rightarrow A =$$

$$\text{Note that } \int \frac{A}{2x+1} dx = A \int \frac{1}{2x+1} dx$$

$$= \frac{A}{2} \int \frac{2}{2x+1} dx = \frac{A}{2} \ln|2x+1|.$$