

Oef 1 (59)

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

St 1: $1 \geq 2? N$

$$\text{St 2 } N = 3x^2 + 2x + 1 \\ D = 4 - 12 = -8 < 0$$

→ stand type

$$= \int \frac{\frac{1}{2}(6x+2) + 2 - 1}{3x^2 + 2x + 1} dx$$

$$= \frac{1}{2} \int \frac{6x+2}{3x^2+2x+1} dx + \int \frac{dx}{3x^2+2x+1}$$

$$= \frac{1}{2} \ln |3x^2+2x+1| + \dots$$

Basistype 2: $\int \frac{dx}{(2^e \text{ gr } D < 0)}$

↳ vorm met de 2^e termenvld
2^e gr een volkomen kwadraat
en corrigeer.

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

$$= \frac{1}{3} \int \frac{dx}{\left(x + \frac{1}{3}\right)^2 + \frac{1}{3} - \frac{1}{9}}$$

$$= \frac{1}{3} \int \frac{dx}{\left(x + \frac{1}{3}\right)^2 + \frac{2}{9}}$$

$$= \frac{1}{3} \cdot \frac{1}{\frac{2}{9}} \int \frac{dx}{\left(\frac{x + \frac{1}{3}}{\sqrt{\frac{2}{9}}}\right)^2 + 1}$$

$$= \frac{\sqrt{2}}{2} \int \frac{du}{u^2+1} = \frac{\sqrt{2}}{2} \ln |u| + C = \frac{\sqrt{2}}{2} \ln \left| \frac{3x+1}{\sqrt{2}} \right| + C$$

$$\leadsto \int \frac{du}{u^2+1}$$

$$\text{stel: } u = \frac{x + \frac{1}{3}}{\sqrt{\frac{2}{9}}} = \frac{3x+1}{\sqrt{2}}$$

$$\Rightarrow du = \frac{3}{\sqrt{2}} dx$$