

$$\int \frac{4x-1}{x^2-2x-8} dx = \int \frac{4x-1}{(x-4)(x+2)} dx$$

$\Delta > 0?$

$$\Delta = (-2)^2 - 4 \cdot 1 \cdot (-8) = 4 + 32 = 36$$

$$\frac{4x-1}{(x-4)(x+2)} = \frac{4(x-4) + 15}{(x-4)(x+2)} = 4 \cdot \frac{(x-4)}{(x-4)(x+2)} + \frac{15}{(x-4)(x+2)}$$

$$= \frac{4}{x+2} + 15 \cdot \frac{1}{(x-4)(x+2)}$$

$$= \frac{4}{x+2} + 15 \cdot \left(\frac{2}{x-4} + \frac{6}{x+2} \right)$$

$$= \frac{4}{x+2} + 15 \cdot \left(\frac{1/6}{x-4} + \frac{-1/6}{x+2} \right)$$

$$= \frac{4}{x+2} + \frac{5/2}{x-4} + \frac{-5/2}{x+2}$$

$$\frac{1}{(x-4)(x+2)} = \frac{2}{x-4} + \frac{6}{x+2}$$

$\cdot (x+2) / x = -2$

$$\frac{1}{x-4} = \frac{2(x+2)}{x-4} + 6$$

$$\frac{1}{-6} = 6$$

$\cdot (x-4) / x = 4$

donne

$$\frac{1}{x+2} = 2 + \frac{6(x+2)}{x-4}$$

$$\frac{1}{6} = 2$$

$$\Rightarrow \int \frac{4x-1}{x^2-2x-8} dx = 4 \ln|x+2| + \frac{5}{2} \ln|x-4| - \frac{5}{2} \ln|x+2| + C$$

$$= \frac{3}{2} \ln|x+2| + \frac{5}{2} \ln|x-4| + C$$