

Exempel 0.0.1

$$\frac{3x+1}{(x-1)^2(x-2)} = \frac{A}{x-1} + \frac{B}{(x-1)^2} + \frac{C}{x-2}$$

Alltså:

$$3x+1 = A(x-1)^2 + B(x-1)(x-1) + C(x-2)$$

- $x = 1 \implies 4 = 0 + 0 - C, \quad C = -4$
- $x = 2 \implies 7 = A$
- x^2 termerna ska vara 0 $\implies 0 = A + B \iff B = -A = -7$

Slutsatsen: Om man vill integrera:

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

...så måste man integrera:

$$-7 \int \frac{1}{x-1} dx - 4 \int \frac{1}{(x-1)^2} dx + 7 \int \frac{1}{x-2} dx$$

...som i sin tur blir:

$$7\ln|x-1| + 7\ln|x-2| + 4(x-1)^{-1} + C$$