

Camilla, Francesca

Aufgabe:

$$\int \frac{4x^3 - 5x^2 + 6x - 7}{x^2 - x - 12} dx$$

Musterlösung:

$$\int \frac{4x^3 - 5x^2 + 6x - 7}{x^2 - x - 12} dx$$

$$\begin{array}{r} (4x^3 - 5x^2 + 6x - 7) : (x^2 - x - 12) = 4x - 1 + \frac{56x + 5}{x^2 - x - 12} \\ -(4x^3 - 4x^2 - 48x) \\ \hline -x^2 + 54x - 7 \\ -(-x^2 - x - 12) \\ \hline 56x + 5 \end{array}$$

$$\frac{56x + 5}{x^2 - x - 12} = \frac{A}{x - 4} + \frac{B}{x + 3}$$

$$56x + 5 = A(x + 3) + B(x - 4)$$

$$A = 23 \frac{5}{7}$$

$$B = 23 \frac{2}{7}$$

$$\begin{aligned} \Rightarrow \int \frac{4x^3 - 5x^2 + 6x - 7}{x^2 - x - 12} dx &= \int 4x - 1 + \frac{23 \frac{5}{7}}{x - 4} + \frac{23 \frac{2}{7}}{x + 3} dx \\ &= \underline{\underline{2x^2 - x + \frac{166}{7} \ln|4 - x| + \frac{163}{7} \ln|3 + x|}} \end{aligned}$$