

$$19a) \int \frac{14-2x}{(x-2)(x+3)} dx$$

$$\frac{14-2x}{(x-2)(x+3)} = \frac{A}{x-2} + \frac{B}{x+3}$$

$$14-2x = A(x+3) + B(x-2)$$

$x = -3$ einsetzen

$$20 = -5B$$

$$B = -4$$

$x = 2$ einsetzen

$$10 = A \cdot 5$$

$$A = 2$$

$$\int f(x) dx = \int \frac{2}{x-2} dx + \int \frac{-4}{x+3} dx$$

$$= 2 \ln|x-2| - 4 \ln|x+3| + C$$

19c)

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

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

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

$x=0$ einsetzen

$$-3 = -B$$

$$B = 3$$

$x=1$ einsetzen

$$1 = C$$

$x=2$, $B=3$, $C=1$ einsetzen

$$3 \cdot 4 + 2 - 3 = A \cdot 2 \cdot 1 + 3 \cdot 1 + 1 \cdot 4$$

$$11 = 2A + 7$$

$$4 = 2A$$

$$A = 2$$

$$\begin{aligned} \int f(x) dx &= \int \frac{2}{x} dx + \int 3 \cdot x^{-2} dx + \int \frac{1}{x-1} dx \\ &= 2 \ln(|x|) - 3x^{-1} + \ln(|x-1|) dx + C \end{aligned}$$

