

Übungen aus gegebenem Anlass – 1 – Ergebnisse

1.

a) $\int \frac{e^x}{4e^x - 4} dx = \frac{1}{4} \ln(e^x - 1) + C$

b) $\int \frac{1}{x \cdot \ln x} dx = \ln |\ln x| + C$

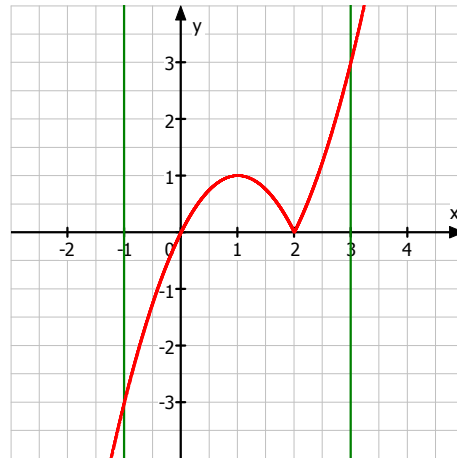
2. $\int_0^2 \frac{5x-1}{2x^2+3} dx - \int_0^2 \frac{x-1}{2x^2+3} dx = \int_0^2 \frac{5x-1-x+1}{2x^2+3} dx = \int_0^2 \frac{4x}{2x^2+3} dx = \left[\ln(2x^2+3) \right]_0^2 = \ln\left(\frac{11}{3}\right)$

3. $f(x) = x \cdot |x-2|$.

a)

$$f(x) = x \cdot |x-2| = x^2 - 2x \quad \text{für } x \geq 2$$

$$f(x) = x \cdot |x-2| = 2x - x^2 \quad \text{für } x < 2$$



b) $\int_{-1}^3 f(x) dx = \int_{-1}^2 (2x - x^2) dx + \int_2^3 (x^2 - 2x) dx = \dots \frac{4}{3}$

c) $A = \left| \int_{-1}^0 (2x - x^2) dx \right| + \left| \int_0^2 (2x - x^2) dx \right| + \left| \int_2^3 (x^2 - 2x) dx \right| = \dots 4$