

$$\int_a^b g'(x) \cdot h(x) dx = [g(x) \cdot h(x)]_a^b - \int_a^b g(x) \cdot h'(x) dx$$

$$\begin{aligned} \text{d)} \int_1^2 3x^2 \ln(x) dx &= [x^3 \ln(x)]_1^2 - \int_1^2 x^3 \cdot \frac{1}{x} dx \\ &= [x^3 \ln(x)]_1^2 - \left[ \frac{1}{3} x^3 \right]_1^2 \\ &= 8 \ln(2) - \frac{1}{3} \approx 3,2 \end{aligned}$$