Regelzusammenfassung Integrale

$$\int_a^b c \cdot x^n \, dx = \left[\frac{c}{n+1} x^{n+1} + \text{Konstante} \right]_a^b = \frac{c}{n+1} b^{n+1} - \frac{c}{n+1} a^{n+1}$$

$$\int_a^b c \cdot x^n dx = c \int_a^b x^n dx$$

$$\int_a^b f(x) + g(x) \, dx = \int_a^b f(x) \, dx + \int_a^b g(x) \, dx$$

$$\int_a^b f(x) \, dx = -\int_b^a f(x) \, dx$$

$$\int_a^b \frac{1}{x^n} dx = \int_a^b x^{-n} dx = \left[\frac{1}{-n+1} x^{-n+1} \right]_a^b = \frac{1}{-n+1} b^{-n+1} - \frac{1}{-n+1} a^{-n+1}$$

(diese Formel gilt nur für $n \neq 1$)

Spezielle Integrale (muß man sich merken!)

$$\int_a^b \frac{1}{x} dx = [\ln x]_a^b = \ln b - \ln a$$

$$\int_a^b e^x dx = [e^x]_a^b = e^b - e^a$$

$$\int_a^b \sqrt{x} \, dx = \left[\frac{2}{3} x^{\frac{3}{2}} \right]_a^b = \frac{2}{3} b^{\frac{3}{2}} - \frac{2}{3} a^{\frac{3}{2}}$$