Integrations – Formelsammlung (ohne Integrationskonstante C)

Grundintegrale:

$$1. \int x^n dx = \frac{x^{n+1}}{n+1} \mid n \neq -1$$

$$2. \int \frac{1}{x} dx = \ln |x|$$

$$3. \int e^x dx = e^x$$

$$4. \int e^{f(x)} dx = \frac{e^{f(x)}}{f'(x)}$$

$$5. \int a^x dx = \frac{a^x}{\ln a} \mid a \in R^+; a \neq 1$$

$$6. \int a^{f(x)} dx = \frac{a^{f(x)}}{f'(x) * \ln a} \mid a \in R^+; a \neq 1$$

$$7. \int \sin(x) dx = -\cos x$$

$$8. \int \cos(x) dx = \sin x$$

$$9. \int \frac{1}{\cos^2 x} dx = \tan x$$

$$10. \int \frac{1}{\sin^2 x} dx = -\cot x$$

$$11. \int \frac{1}{\sqrt{1-x^2}} dx = \arcsin x$$

$$12. \int \frac{1}{1+x^2} dx = \arctan x$$

Allgemeine Integrationsregeln:

$$\int a * f(x) dx = a \int f(x) dx$$

$$\int f_1(x) \pm f_2(x) dx = \int f_1(x) dx \pm \int f_2(x) dx$$

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

$$\int_a^b f(x) dx = \int_a^c f(x) dx + \int_c^b f(x) dx$$

Volumen von Rotationskörpern:

$$V_x = \pi * \int_{x_1=a}^{x_2=b} y^2 dx$$

$$V_y = \pi * \int_{y_1=a}^{y_2=b} x^2 dy$$

sonstige häufig vorkommende Integrale:

$$\int \sin^2(x) dx = \frac{x - \sin x * \cos x}{2} = \frac{x}{2} - \frac{\sin 2x}{4}$$

$$\int \cos^2(x) dx = \frac{x + \sin x * \cos x}{2} = \frac{x}{2} + \frac{\sin 2x}{4}$$