

## НЕОПРЕДЕЛЕННЫЙ ИНТЕГРАЛ

### Правила интегрирования

$$\int f'(x)dx = f(x) + C, \quad \int C \cdot f(x)dx = C \cdot \int f(x)dx,$$

$$\int (f(x) \pm g(x))dx = \int f(x)dx \pm \int g(x)dx,$$

$$\text{Если } \int f(x)dx = F(x) + C, \text{ то } \int (ax + b)dx = \frac{1}{a}F(ax + b) + C.$$

### Таблица интегралов

$$\int x^n dx = \frac{x^{n+1}}{n+1} + C.$$

$$\int \frac{dx}{x} = \ln |x| + C, \quad x \neq 0.$$

$$\int a^x dx = \frac{a^x}{\ln a} + C, \quad a > 0, \quad a \neq 1.$$

$$\int e^x dx = e^x + C.$$

$$\int \cos x dx = \sin x + C.$$

$$\int \sin x dx = -\cos x + C.$$

$$\int \operatorname{tg} x dx = -\ln |\cos x| + C.$$

$$\int \operatorname{ctg} x dx = \ln |\sin x| + C.$$

$$\int \frac{1}{\cos^2 x} dx = \operatorname{tg} x + C.$$

$$\int \frac{1}{\sin^2 x} dx = -\operatorname{ctg} x + C.$$

$$\int \frac{1}{a^2 + x^2} dx = \frac{1}{a} \operatorname{arctg} \frac{x}{a} + C \quad \left( -\frac{1}{a} \operatorname{arcctg} \frac{x}{a} + C \right).$$

$$\int \frac{1}{x^2 - a^2} dx = \frac{1}{2a} \ln \left| \frac{a - x}{a + x} \right| + C.$$

$$\int \frac{1}{\sqrt{a^2 - x^2}} dx = \operatorname{arcsin} \frac{x}{a} + C \quad \left( -\operatorname{arccos} \frac{x}{a} + C \right).$$

$$\int \frac{1}{\sqrt{x^2 \pm a^2}} dx = \ln |x + \sqrt{x^2 \pm a^2}| + C.$$

$$\int \operatorname{sh} x dx = \operatorname{ch} x + C.$$

$$\int \operatorname{ch} x dx = \operatorname{sh} x + C.$$

$$\int \frac{1}{\operatorname{ch}^2 x} dx = \operatorname{th} x + C.$$

$$\int \frac{1}{\operatorname{sh}^2 x} dx = -\operatorname{cth} x + C.$$