Таблицы Формул

Производная. Первообразная. Интеграл

Производная

$f = c$	$f' = 0$
$f = x^p$	$f' = p \cdot x^{p-1}$
$f = \sqrt{x}$	$f' = \frac{1}{2\sqrt{x}}$
$f = \sin x$	$f' = \cos x$
$f = \cos x$	$f' = -\sin x$
$f = \tan x$	$f' = \frac{1}{\cos^2 x}$
$f = \operatorname{ctg} x$	$f' = -\frac{1}{\sin^2 x}$
$f = \ln x$	$f' = \frac{1}{x}$
$f = a^x$	$f' = a^x \cdot \ln a$
$f = e^x$	$f' = e^x$
$f = \arcsin x$	$f' = \frac{1}{\sqrt{1-x^2}}$
$f = \arccos x$	$f' = -\frac{1}{\sqrt{1-x^2}}$
$f = \arctan x$	$f' = \frac{1}{1+x^2}$
$f = \operatorname{arcctg} x$	$f' = -\frac{1}{1+x^2}$

Первообразная

$f = c$	$F = c \cdot x$
$f = x^p$	$F = \frac{x^{p+1}}{p+1}$
$f = \sqrt{x}$	$F = \frac{2\sqrt[2]{x^3}}{3}$
$f = \sin x$	$F = -\cos x$
$f = \cos x$	$F = \sin x$
$f = \frac{1}{\cos^2 x}$	$F = \tan x$
$f = \frac{1}{\sin^2 x}$	$F = -\operatorname{ctg} x$
$f = \frac{1}{x}$	$F = \ln x$
$f = a^x$	$F = \frac{a^x}{\ln a}$
$f = e^x$	$F = e^x$
$f = \frac{1}{\sqrt{1-x^2}}$	$F = \arcsin x$
$f = \frac{1}{1+x^2}$	$F = \arccos x$
$f = \frac{1}{a^2+x^2}$	$F = \frac{1}{a} \cdot \operatorname{arctg} \frac{x}{a}$
$f = \frac{1}{x^2-a^2}$	$F = \frac{1}{2a} \cdot \ln \left\lvert \frac{x-a}{x+a} \right\rvert$

Неопределенный интеграл

$$\int c\,dx = c \cdot x + C$$

$$\int x^p\,dx = \frac{x^{p+1}}{p+1} + C$$

$$\int \sqrt{x}dx = \frac{2\sqrt[2]{x^3}}{3} + C$$

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

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

$$\int \frac{1}{\cos^2 x}dx = \tan x + C$$

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

$$\int \frac{1}{x}dx = \ln x + C$$

$$\int a^x\,dx = \frac{a^x}{\ln a} + C$$

$$\int e^x\,dx = e^x + \mathrm{C}$$

$$\int \frac{1}{\sqrt{1-x^2}}dx = \arcsin x + C$$

$$\int \frac{1}{1+x^2}dx = \arccos x + C$$

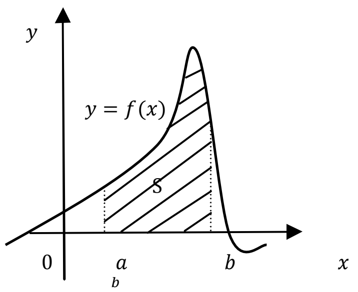
$$\int \frac{1}{a^2+x^2}dx = \frac{1}{a} \cdot \operatorname{arctg} \frac{x}{a} + C$$

$$\int \frac{1}{x^2-a^2}dx = \frac{1}{2a} \cdot \ln \left\lvert \frac{x-a}{x+a} \right\rvert + C$$

Формулы:

1. $(f \pm g)' = f' \pm g'$
2. $(c \cdot f)' = c \cdot f'$
3. $(f \cdot g)' = f' \cdot g + g' \cdot f$
4. $\left(\frac{f}{g}\right)' = \frac{f' \cdot g - g' \cdot f}{g^2}$
5. $(f(g(x)))' = f'_g \cdot g'(x)$

Определенный интеграл



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

Свойства:

1. $\int (f \pm g)dx = \int f dx \pm \int g dx$
2. $\int p \cdot f dx = p \int f dx$
3. $\int F'(x)dx = \int dF(x) = F(x) + C$
4. $\int f \cdot g dx = ?$

Интегрирование по частям

$$\left| \begin{matrix} U = f \\ dU = f'dx \end{matrix} \right| \begin{matrix} dV = gdx \\ V = G, \text{ где } G' = g \end{matrix} \right|$$

$$\int f \cdot g dx = f \cdot G - \int G \cdot f' dx$$

или

$$\boxed{\int u dv = u \cdot v - \int v du}$$