

ТАБЛИЦА ОСНОВНЫХ ИНТЕГРАЛОВ

$\int du = u + c$	11. $\int \frac{du}{u^2 + a^2} = \frac{1}{a} \operatorname{arctg} \frac{u}{a} + c$
$\int u^a du = \frac{u^{a+1}}{a+1} + c \quad (a \neq -1)$	12. $\int \operatorname{ch} u du = \operatorname{sh} u + c$
$\int \frac{du}{\sqrt{u}} = 2\sqrt{u} + c$	13. $\int \operatorname{sh} u du = \operatorname{ch} u + c$
$\int \frac{du}{u} = \ln u + c$	14. $\int \frac{du}{\operatorname{ch}^2 u} = \operatorname{th} u + c$
$\int a^u du = \frac{a^u}{\ln a} + c$	15. $\int \frac{du}{\operatorname{sh}^2 u} = -\operatorname{cth} u + c$
$\int e^u du = e^u + c$	16. $\int \frac{du}{\sqrt{u^2 \pm a^2}} = \ln \left u + \sqrt{u^2 \pm a^2} \right + c$
$\int \cos u du = \sin u + c$	17. $\int \frac{du}{u^2 - a^2} = \frac{1}{2a} \ln \left \frac{u-a}{u+a} \right + c$
$\int \sin u du = -\cos u + c$	18. $\int \frac{du}{a^2 - u^2} = \frac{1}{2a} \ln \left \frac{a+u}{a-u} \right + c$
$\int \frac{du}{\cos^2 u} = \operatorname{tg} u + c$	19. $\int \frac{du}{\sin u} = \ln \left \operatorname{tg} \frac{u}{2} \right + c$
$\int \frac{du}{\sin^2 u} = -\operatorname{ctg} u + c$	20. $\int \frac{du}{\cos u} = \ln \left \operatorname{tg} \left(\frac{u}{2} + \frac{\pi}{4} \right) \right + c$
$\int \frac{du}{\sqrt{a^2 - u^2}} = \operatorname{arcsin} \frac{u}{a} + c$	

Формула Ньютона-Лейбница

$$\int_a^b f(x) dx = F(x) \Big|_a^b = F(b) - F(a) \quad (F'(x) = f(x))$$

$$\int_a^a f_{\text{неч}}(x) dx = 0$$

$$\int_a^a f_{\text{чет}}(x) dx = 2 \int_0^a f_{\text{неч}}(x) dx$$

ТАБЛИЦА ПРОИЗВОДНЫХ

- $c' = 0$
- $(cy)' = c \cdot y'$
- $(u \pm v)' = u' \pm v'$
- $(u \cdot v)' = u'v + v'u$
- $\left(\frac{u}{v}\right)' = \frac{u'v - v'u}{v^2}$
- $[y(u(x))]' = y'_u \cdot u'_x$

1	$(u^a)' = a \cdot u^{a-1} \cdot u'$	10	$(\operatorname{tg} u)' = \frac{1}{\cos^2 u} \cdot u'$
2	$(\sqrt{u})' = \frac{1}{2\sqrt{u}} \cdot u'$	11	$(\operatorname{ctg} u)' = -\frac{1}{\sin^2 u} \cdot u'$
3	$\left(\frac{1}{u}\right)' = -\frac{1}{u^2} \cdot u'$	12	$(\operatorname{arcsin} u)' = \frac{1}{\sqrt{1-u^2}} \cdot u'$
4	$(a^u)' = a^u \ln a \cdot u'$	13	$(\operatorname{arccos} u)' = -\frac{1}{\sqrt{1-u^2}} \cdot u'$
5	$(e^u)' = e^u \cdot u'$	14	$(\operatorname{arctg} u)' = \frac{1}{1+u^2} \cdot u'$
6	$(\ln u)' = \frac{1}{u} \cdot u'$	15	$(\operatorname{arccotg} u)' = -\frac{1}{1+u^2} \cdot u'$
7	$(\log_a u)' = \frac{\log_a e}{u} \cdot u' = \frac{1}{u \ln a} \cdot u'$	16	$(\operatorname{sh} u)' = \operatorname{ch} u \cdot u'$
8	$(\sin u)' = \cos u \cdot u'$	17	$(\operatorname{ch} u)' = \operatorname{sh} u \cdot u'$
9	$(\cos u)' = -\sin u \cdot u'$	18	$(\operatorname{th} u)' = \frac{1}{\operatorname{ch}^2 u} \cdot u'$
		19	$(\operatorname{cth} u)' = -\frac{1}{\operatorname{sh}^2 u} \cdot u'$

$$(u^v)' = u^v \cdot \ln u \cdot u' + v \cdot u^{v-1} \cdot u'$$