Таблично представяне на интеграли

Преобразувания

sin	$\mathrm{sh}x \overset{\text{def}}{=} \frac{e^x - e^{-x}}{2}$	cos	$\mathrm{ch}x \overset{\text{def}}{=} \frac{e^x + e^{-x}}{2}$
tan	$\mathrm{th}x \overset{\text{def}}{=} \frac{\mathrm{sh}x}{\mathrm{ch}x}$	cotg	$\mathrm{cth}x = \frac{\mathrm{ch}x}{\mathrm{sh}x}$

$$\int f(ax+b)dx\frac{a}{a} = \int f(ax+b)d\frac{1}{a}a = \frac{1}{a}\int f(ax+b)d(ax+b) = \frac{1}{a}\mathrm{F}(ax+b) + C$$

u=u(x)

№	Формула	№	Формула
1	$\int 1dx = x + C$	2	$\int x^m dx = \frac{x^{m+1}}{m+1} + C \ , m \neq -1$
3	$\int \frac{1}{x}dx = \ln\lvert x\rvert + C \ , x \neq 0$	4	$\int \frac{1}{1+x^2}dx = arc\ \tan x + C$
5	$\int \frac{1}{\sqrt{1-x^2}}dx = arc\sin x + C$	6	$\int e^x dx = e^x + C$
7	$\int a^x dx = \frac{a^x}{\ln a} + C, a > 0, a \neq 1$	8	$\int \sin x\,.\,dx = -\cos x + C$
9	$\int \cos x\,.\,dx = \sin x + C$	10	$\int \frac{1}{\cos^2 x}dx = \tan x + C$
11	$\int \frac{1}{\sin^2 x}dx = -\operatorname{cotg} x + C$	12	$\int \mathrm{sh}x.\,dx = \mathrm{ch}x + C$
13	$\int \mathrm{ch}x.\,dx = \mathrm{sh}x + C$	14	$\int \frac{1}{\mathrm{ch}^2 x}dx = \mathrm{th}x + C$
15	$\int \frac{1}{\mathrm{sh}^2 x}dx = -\mathrm{cth}x + C$	16	$\int \frac{f'(x)dx}{f(x)} = \ln\lvert f(x)\rvert + C, f(x) \neq 0$
17	$\int \frac{f'(x)dx}{\sqrt{f(x)}} = 2\sqrt{f(x)} + C$	18	$\int \frac{1}{a^2+x^2}dx = \frac{1}{a}arc\ \tan\left(\frac{x}{a}\right) + C$
19	$\int \frac{1}{a^2-x^2}dx = \frac{1}{2a}\ln\left\lvert\frac{x+a}{x-a}\right\rvert + C$	20	$\int \frac{1}{\sqrt{a^2-x^2}}dx = arc\sin\frac{x}{a} + C$
21	$\int \frac{1}{\sqrt{x^2+\gamma}}dx = \ln\left\lvert x + \sqrt{x^2+\gamma}\right\rvert + C$	22	$\int \frac{1}{\sin x}dx = \ln\left\lvert\tan\frac{x}{2}\right\rvert + C$
23	$\int \frac{1}{\cos x}dx = \ln\left\lvert\tan\left(\frac{x}{2}+\frac{\pi}{4}\right)\right\rvert + C$	24	$\int \tan x.\,dx = -\ln\lvert\cos x\rvert + C$
25	$\int \mathrm{cotg}x.\,dx = \ln\lvert\sin x\rvert + C$	26	$\int \frac{u'.\,dx}{\sqrt{u^2+a}} = \ln\left\lvert u + \sqrt{u^2+a}\right\rvert + C$
27	$\int u^\alpha\,.\,u.\,dx = \int u^\alpha\,.\,du = \frac{u^{\alpha+1}}{\alpha+1} + C \ , \alpha \neq -1$	28	$\int \cos u.\,u'.\,dx = \sin u + C$
29	$\int \frac{u'}{u}du = \int \frac{du}{u} = \ln\lvert u\rvert + C$	30	$\int a^u.\,u'.\,dx = \int a^u.\,du = \frac{a^u}{\ln a} + C$
31	$\int \frac{u'.\,dx}{\cos^2 u} = \tan u + C$	32	$\int e^u.\,u'dx = \int e^u.\,du = e^u + C$
33	$\int \frac{u'.\,dx}{\sin^2 u} = -cotu + C$	34	$\int \sin u.\,u'.\,dx = -cosu + C$
35	$\int \frac{u'.\,dx}{\sqrt{1-u^2}} = -\mathrm{arc}\cos u + C = \mathrm{arc}\sin u + C$	36	$\int \frac{u'.\,dx}{1+u^2} = -\mathrm{arc}\,\mathrm{cotg}u + C = \mathrm{arc}\tan u + C$

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Таблично представяне на диференциали

№	Функция	Производна на фунцкия	Производна на сложна фунцкия
1	$y = a\,, a = const$	$(a)' = 0$	
2	$y = x$	$(x)' = 1$	
3	$y = ax$	$(ax)' = a$	
4	$y = ax + b$	$(ax + b)' = a$	
5	$y = ax^2 + bx + c$	$\left(ax^2 + bx + c\right)' = 2ax + b$	
6	$y = u \pm v$	$(u \pm v)' = u' \pm v'$	
7	$y = u.v$	$(u.v)' = u'.v + u.v'$	
8	$y = u.v.w$	$(u.v.w)' = u'.v.w + u.v'.w + u.v.w'$	
9	$y = x^2$	$\left(x^2\right)' = 2x$	$\left(u^2\right)' = 2u.u'$
10	$y = x^n$	$(x^n)' = n.x^{n-1}$	$(u^n)' = n.u^{n-1}.u'$
11	$y = \sqrt{x}$	$\left(\sqrt{x}\right)' = \frac{1}{2\sqrt{x}}$	$\left(\sqrt{u}\right)' = \frac{1}{2\sqrt{u}}.u'$
12	$y = \sqrt[n]{x}$	$\left(\sqrt[n]{x}\right)' = \frac{1}{n\sqrt[n]{x^{n-1}}}$	$\left(\sqrt[n]{u}\right)' = \frac{1}{n\sqrt[n]{u^{n-1}}}.u'$
13	$y = \frac{1}{x}$	$\left(\frac{1}{x}\right)' = -\frac{1}{x^2}$	$\left(\frac{1}{u}\right)' = -\frac{1}{u^2}.u'$
14	$y = \frac{1}{x^n}$	$\left(\frac{1}{x^n}\right)' = -\frac{n}{x^{n+1}}$	$\left(\frac{1}{u^n}\right)' = -\frac{n}{u^{n+1}}.u'$
15	$y = \frac{1}{\sqrt{x}}$	$\left(\frac{1}{\sqrt{x}}\right)' = -\frac{1}{2\sqrt{x^3}}$	$\left(\frac{1}{\sqrt{u}}\right)' = -\frac{1}{2\sqrt{u^3}}.u'$
16	$y = \frac{1}{\sqrt[n]{x}}$	$\left(\frac{1}{\sqrt[n]{x}}\right)' = -\frac{1}{n\sqrt[n]{x^{n+1}}}$	$\left(\frac{1}{\sqrt[n]{u}}\right)' = -\frac{1}{n\sqrt[n]{u^{n+1}}}.u'$
17	$y = \sin x$	$(\sin x)' = \cos x$	$(\sin u)' = \cos u.u'$
18	$y = \cos x$	$(\cos x)' = -\sin x$	$(\cos u)' = -\sin u.u'$
19	$y = \tan x$	$(\tan x)' = \frac{1}{\cos^2 x}$	$(\tan u)' = \frac{1}{\cos^2 u}.u'$
20	$y = \operatorname{cotg} x$	$(\operatorname{cotg} x)' = \frac{-1}{\sin^2 x}$	$(\operatorname{cotg} u)' = \frac{-1}{\sin^2 u}.u'$
21	$y = \ln x$	$(\ln x)' = \frac{1}{x}$	$(\ln u)' = \frac{1}{u}.u'$
22	$y = \lg x$	$(\lg x)' = \frac{1}{x}.\lg e$	$(\lg u)' = \frac{1}{u}.\lg e.u'$
23	$y = \log_a x$	$(\log_a x)' = \frac{1}{x}.\frac{1}{\ln a}$	$(\log_a u)' = \frac{1}{u}.\frac{1}{\ln a}.u'$
24	$y = e^x$	$(e^x)' = e^x$	$(e^u)' = e^u.u'$
25	$y = a^x$	$(a^x)' = a^x.\ln a$	$(a^u)' = a^u.\ln a.u'$
26	$y = \operatorname{arc}\sin x$	$(\operatorname{arc}\sin x)' = \frac{1}{\sqrt{a - x^2}}$	$(\operatorname{arc}\sin u)' = \frac{u}{\sqrt{a - u^2}}$
27	$y = \operatorname{arc}\cos x$	$(\operatorname{arc}\cos x)' = \frac{-1}{\sqrt{1 - x^2}}$	$(\operatorname{arc}\cos u)' = \frac{-u}{\sqrt{1 - u^2}}$
28	$y = \operatorname{arc}\tan x$	$(\operatorname{arc}\tan x)' = \frac{1}{1 + x^2}$	$(\operatorname{arc}\tan u)' = \frac{u}{1 + u^2}$
29	$y = \operatorname{arc}\operatorname{cotg} x$	$(\operatorname{arc}\operatorname{cotg} x)' = \frac{-1}{1 + x^2}$	$(\operatorname{arc}\operatorname{cotg} u)' = \frac{-u}{1 + u^2}$
30	$y = u^v$	$(u^v)' = e^{v\lg u}\left(v'.\ln u + v.\frac{u'}{u}\right) = u^v\left(v'.\ln u + v.\frac{u'}{u}\right)$	

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