DERIVAREA Şi INTEGRAREA FUNCȚIILOR COMPUSE. FORMULE TRIGONOMETRIE

1	$\left(u^n\right)' = n \cdot u^{n-1} \cdot u'$
2	$\left(\sqrt[n]{u}\right)' = \dfrac{u'}{n\sqrt[n]{u^{n-1}}}$
3	$\left(\ln u\right)' = \dfrac{u'}{u}$
4	$\left(a^n\right)' = a^u \cdot u'$
5	$\left(\sin u\right)' = u' \cdot \cos u$
6	$\left(\cos u\right)' = -u' \cdot \sin u$
7	$\left(\tan u\right)' = \dfrac{u'}{\cos^2 u}$
8	$\left(ctg\, u\right)' = -\dfrac{u'}{\sin^2 u}$
9	$\left(\arcsin u\right)' = \dfrac{u'}{\sqrt{1-u^2}}$
10	$\left(\arccos u\right)' = -\dfrac{u'}{\sqrt{1-u^2}}$
11	$\left(\arctan u\right)' = -\dfrac{u'}{1+u^2}$
12	$\left(fg\right)' = f'g + fg'$
13	$\left(\dfrac{f}{g}\right)' = \dfrac{f' \cdot g - f \cdot g'}{g^2}$
14	$\left(f^{-1}\right)' = \dfrac{1}{f' \cdot f^{-1}}$
15	$\left(\lambda f\right)' = \lambda f'$
16	$\left(f \pm g\right)' = f' \pm g'$
17	$\int u^n(x)u'(x)dx = \dfrac{u^{n+1}(x)}{n+1}$
18	$\int a^{u(x)}u'(x)dx = \dfrac{a^{u(x)}}{\ln a}$
19	$\int \dfrac{u'(x)}{u(x)}dx = \ln\lvert u(x)\rvert$
20	$\int \dfrac{u'(x)}{u^2(x)+a^2}dx = \dfrac{1}{a} arctg \dfrac{u(x)}{a}$
21	$\int \dfrac{u'(x)}{u^2(x)-a^2}dx = \dfrac{1}{2a}\ln\left\lvert\dfrac{u(x)-a}{u(x)+a}\right\rvert$
22	$\int u'(x)\sin u(x)dx = -\cos u(x)$

23	$\int u'(x)\cos u(x)dx = \sin u(x)$
24	$\int \dfrac{u'(x)}{\cos^2 u(x)}dx = \tan\left(u(x)\right)$
25	$\int \dfrac{u'(x)}{\sin^2 u(x)}dx = -ctg\left(u(x)\right)$
26	$\int u'(x)\tan u(x)dx = -\ln\lvert\cos u(x)\rvert$
27	$\int u'(x)ctg\left(u(x)\right)dx = \ln\lvert\sin u(x)\rvert$
28	$\int \dfrac{u'(x)}{\sqrt{u^2(x)-a^2}}dx = \ln\left\lvert u(x)+\sqrt{u^2(x)-a^2}\right\rvert$
29	$\int \dfrac{u'(x)}{\sqrt{u^2(x)+a^2}}dx = \ln\left\lvert u(x)+\sqrt{u^2(x)+a^2}\right\rvert$
30	$\int \dfrac{u'(x)}{\sqrt{a^2-u^2(x)}}dx = \arcsin\dfrac{u(x)}{a}$
31	$\int f(x)g(x)dx = f(x)g(x) - \int f'(x)g(x)dx$
32	$\int \cos^2 x dx = \dfrac{1}{2}\cos x \sin x + \dfrac{1}{2}x$
33	$\int \sin^2 x dx = -\dfrac{1}{2}\cos x \sin x + \dfrac{1}{2}x$
34	$\int \cos^2 ax dx = \dfrac{\frac{1}{2}\cos ax \sin ax + \frac{1}{2}ax}{a}$
35	$\int \sin^2 ax dx = \dfrac{-\frac{1}{2}\cos ax \sin ax + \frac{1}{2}ax}{a}$
36	$\int x\cos ax dx = \dfrac{\cos ax + ax\sin ax}{a^2}$
37	$\int x\sin ax dx = \dfrac{\sin ax - ax\cos ax}{a^2}$
38	$\int x^2\sin ax dx = \dfrac{-a^2x^2\cos ax + 2\cos ax + 2ax\sin ax}{a^3}$
39	$\int x^2\cos ax dx = \dfrac{a^2x^2\sin ax - 2\sin ax + 2ax\cos ax}{a^3}$
40	$\int x^2\sin x dx = \left(2-x^2\right)\cos x + 2x\sin x$
41	$\int x^2\cos x dx = x^2\sin x - 2\sin x + 2x\cos x$
42	$\int x\sin x dx = \sin x - x\cos x$
43	$\int x\cos x dx = \cos x + x\sin x$
44	$\int x^n \ln x dx = -\dfrac{1}{n^2+2n+1}x^{n+1} + \dfrac{1}{n+1}x^{n+1}\ln x$
45	$\int \cos\left(\ln x\right)dx = \dfrac{1}{2}x\left[\sin\left(\ln x\right) + \cos\left(\ln x\right)\right]$
46	$\int \ln x dx = x\left(\ln x - 1\right)$
47	$\int \dfrac{1}{\sin x}dx = \ln\left(\tan\dfrac{x}{2}\right)$
48	$\int \dfrac{e^{2x}}{1+e^x}dx = e^x - \ln\left(1+e^x\right)$

49	$\int_0^\infty \frac{x\sin ax}{b^2+a^2}dx=\frac{\pi}{2}e^{-ab}$
50	$\int_0^\infty \frac{\cos ax}{b^2+x^2}dx=\frac{\pi}{2b}e^{-ab}$
51	$\int_0^\infty \frac{\cos ax}{\left(b^2+x^2\right)^2}dx=\frac{\pi}{4b^3}\sin ab-ab\cos ab$
52	$\int_0^\infty \frac{\sin x}{x}dx=\int_0^\infty\left(\frac{\sin x}{x}\right)^2dx=\frac{1}{2}$
53	$\int_0^\infty e^{-ax^2}dx=\frac{1}{2}\sqrt{\frac{\pi}{a}}$
54	$\int_0^\infty x^2e^{-ax^2}dx=\frac{1}{4a}\sqrt{\frac{\pi}{a}}$
55	$\int xe^{ax}dx=\frac{1}{a^2}e^{ax}\left(ax-1\right)$
56	$\int xe^{ax^2}dx=\frac{1}{2a}e^{ax^2}$
57	$\int e^{ax}\sin bxdx=\frac{1}{b^2+a^2}e^{ax}\left[a\sin bx-b\cos bx\right]$
58	$\int e^{ax}\cos bxdx=\frac{1}{b^2+a^2}e^{ax}\left[b\sin bx+a\cos bx\right]$
59	$\int\frac{1}{a^2+b^2x^2}dx=\frac{1}{ab}\arctan\left\|\frac{bx}{a}\right\|$
60	$\int\frac{x^2}{a^2+b^2x^2}dx=\frac{x}{b^2}-\frac{a}{b^3}\arctan\left\|\frac{bx}{a}\right\|$
61	45 $\int\cos ax\sin bxdx=-\frac{1}{2}\frac{\cos(a+b)x}{a+b}+\frac{1}{2}\frac{\cos(a-b)x}{a-b}$
62	$\int\cos ax\cos bxdx=\frac{1}{2}\frac{\sin(a-b)x}{a-b}+\frac{1}{2}\frac{\sin(a+b)x}{a+b}$
63	$\int_{-\infty}^\infty e^{-x^2}dx=\sqrt{\pi}$
64	$\int x^2e^{-ax}dx=-\frac{1}{a}x^2e^{-ax}-\frac{2}{a^2}xe^{-ax}-\frac{2}{a^3}e^{-ax}$
65	$\int x^2e^{ax}dx=\frac{1}{a}x^2e^{ax}-\frac{2}{a^2}xe^{ax}+\frac{2}{a^3}e^{ax}$
66	$\sin a\cdot\sin b=\frac{\cos(a-b)-\cos(a+b)}{2}$
67	$\sin a\cdot\cos b=\frac{\sin(a+b)+\sin(a-b)}{2}$
68	$\cos a\cdot\sin b=\frac{\sin(a+b)-\sin(a-b)}{2}$
69	$\cos a\cdot\cos b=\frac{\cos(a-b)+\cos(a+b)}{2}$
70	$\sin a=\frac{1}{2}\left(e^{ja}-e^{-ja}\right)$
71	$\cos a=\frac{1}{2}\left(e^{ja}+e^{-ja}\right)$

72	$sha=\frac{1}{2}\left(e^a-e^{-a}\right)$
73	$cha=\frac{1}{2}\left(e^a+e^{-a}\right)$
74	$\cos^2x+\sin^2x=1$
75	$\sin(-x)=-\sin x$
76	$\cos(-x)=\cos x$
77	$\sin\left(\frac{\pi}{2}-x\right)=\cos x$
78	$\cos\left(\frac{\pi}{2}-x\right)=\sin x$
79	$\cos\left(a\pm b\right)=\cos a\cos b\mp\sin a\sin b$
80	$\sin\left(a\pm b\right)=\sin a\cos b\pm\sin b\,s\cos a$
81	$\sin 2a=2\sin a\cos a$
82	$\cos 2a=\cos^2a-\sin^2a=2\cos^2a-1$
83	$\sin 3a=3\sin a-4\sin^3a$
84	$\cos 3a=4\cos^3a-3\cos a$
85	$\cos\frac{a}{2}=\sqrt{\frac{1+\cos a}{2}}$
86	$\sin\frac{a}{2}=\sqrt{\frac{1-\cos a}{2}}$
87	$\tan a\cdot ctga=1$
88	$\tan\left(a\pm b\right)=\frac{\tan a\pm\tan b}{1\mp\tan a\tan b}$
89	$\tan\left(2a\right)=\frac{2\tan a}{1-\tan^2a}$
90	$tg\frac{a}{2}=\frac{\sin a}{1+\cos a}=\sqrt{\frac{1-\cos a}{1+\cos a}}$
91	$\sin a=\frac{2\tan\frac{a}{2}}{1+\tan^2\frac{a}{2}}$
92	$\cos a=\frac{1-\tan^2\frac{a}{2}}{1+\tan^2\frac{a}{2}}$
93	$\sin a+\sin b=2\sin\frac{a+b}{2}\cos\frac{a-b}{2}$
94	$\sin a-\sin b=2\cos\frac{a+b}{2}\sin\frac{a-b}{2}$
95	$\cos a+\cos b=2\cos\frac{a+b}{2}\cos\frac{a-b}{2}$
96	$\cos a-\cos b=-2\sin\frac{a+b}{2}\sin\frac{a-b}{2}$
97	$\tan a\pm\tan b=\frac{\sin\left(a\pm b\right)}{\cos a\cos b}$