Goniometrické vzorce

1. $\sin(\alpha+\beta)=\sin\alpha\cos\beta+\cos\alpha\sin\beta$,
2. $\cos(\alpha+\beta)=\cos\alpha\cos\beta-\sin\alpha\sin\beta$,
3. $\sin 2\alpha=2\sin\alpha\cos\alpha,\quad \cos 2\alpha=\cos^2\alpha-\sin^2\alpha,\quad \cos^2\alpha+\sin^2\alpha=1$,
4. $\cos^2\alpha=\dfrac{1+\cos 2\alpha}{2},\quad \sin^2\alpha=\dfrac{1-\cos 2\alpha}{2}$,
5. $\cos\alpha\cos\beta=\frac{1}{2}\left(\cos(\alpha+\beta)+\cos(\alpha-\beta)\right)$,
6. $\sin\alpha\sin\beta=\frac{1}{2}\left(\cos(\alpha-\beta)-\cos(\alpha+\beta)\right)$,
7. $\sin\alpha\cos\beta=\frac{1}{2}\left(\sin(\alpha-\beta)+\sin(\alpha+\beta)\right)$.
8. $\sin 0=\cos\dfrac{\pi}{2}=\dfrac{\sqrt{0}}{2},\quad \sin\dfrac{\pi}{6}=\cos\dfrac{\pi}{3}=\dfrac{\sqrt{1}}{2},\quad \sin\dfrac{\pi}{4}=\cos\dfrac{\pi}{4}=\dfrac{\sqrt{2}}{2}$,
9. $\sin\dfrac{\pi}{3}=\cos\dfrac{\pi}{6}=\dfrac{\sqrt{3}}{2},\quad \sin\dfrac{\pi}{2}=\cos 0=\dfrac{\sqrt{4}}{2}$,
10. $\cos n\pi=(-1)^n,\ \sin(2k-1)\dfrac{\pi}{2}=(-1)^{k+1},\ \cos(2k-1)\dfrac{\pi}{2}=0$,

Logaritmy

1. $\log_a(xy)=\log_a x+\log_a y$,
2. $\log_a\left(\dfrac{x}{y}\right)=\log_a x-\log_a y$,
3. $\log_a x=\dfrac{\log_b x}{\log_b a}=\dfrac{\ln x}{\ln a}$,

Derivácie

1. $(x^\alpha)' = \alpha\ x^{\alpha-1}$.
2. $(e^x)' = e^x$.
3. $(\sin x)' = \cos x$.
4. $(\cos x)' = -\sin x$.
5. $(\operatorname{tg}\ x)' = \dfrac{1}{\cos^2 x}$.
6. $(\operatorname{cotg}\ x)' = \dfrac{-1}{\sin^2 x}$.
7. $(\ln x)' = \dfrac{1}{x}$.
8. $(\log_a x)' = \dfrac{1}{x\ \ln a}$.
9. $(\arcsin x)' = \dfrac{1}{\sqrt{1-x^2}}$.
10. $(\arccos x)' = \dfrac{-1}{\sqrt{1-x^2}}$.
11. $(\operatorname{arctg} x)' = \dfrac{1}{1+x^2}$.
12. $(\operatorname{arccotg} x)' = \dfrac{-1}{1+x^2}$.
13. $(a^x)' = a^x \ln a$.

Integrály

1) $\int x^\alpha \, dx = \dfrac{x^{\alpha+1}}{\alpha+1} \quad \text{pre} \quad \alpha \neq -1.$

2) $\int \dfrac{1}{x} \, dx = \ln|x|.$

3) $\int \dfrac{f'(x)}{f(x)} \, dx = \ln|f(x)|.$

4) $\int \sin x \, dx = -\cos x.$

5) $\int \cos x \, dx = \sin x.$

6) $\int \dfrac{1}{\cos^2 x} \, dx = \operatorname{tg} x.$

7) $\int \dfrac{1}{\sin^2 x} \, dx = -\operatorname{cotg} x.$

8) $\int \dfrac{1}{1+x^2} \, dx = \operatorname{arctg} x.$

9) $\int \dfrac{1}{\sqrt{1-x^2}} \, dx = \arcsin x.$

10) $\int e^x \, dx = e^x.$

11) $\int a^x \, dx = \dfrac{a^x}{\ln a}.$

12) Ak $\int f(x) \, dx = F(x), \quad$ potom $\quad \int f(ax+b) \, dx = \dfrac{1}{a} F(ax+b).$

13) $\int \dfrac{1}{(x-b)^2+a^2} \, dx = \dfrac{1}{a} \operatorname{arctg} \dfrac{(x-b)}{a}.$

Substitúcie

1. $\operatorname{tg}\frac{x}{2} = t,\ x = 2\operatorname{arctg} t,\ dx = \frac{2\,dt}{1+t^2},\ \sin x = \frac{2t}{t^2+1},\ \cos x = \frac{1-t^2}{t^2+1},$
2. $\operatorname{tg} x = t,\ x = \operatorname{arctg} t,\ dx = \frac{dt}{1+t^2},\ \sin^2 x = \frac{t^2}{t^2+1},\ \cos^2 x = \frac{1}{t^2+1},\ \sin 2x = \frac{2t}{t^2+1},$
3. $\sqrt[k]{\frac{ax+b}{cx+d}} = t,\ \frac{ax+b}{cx+d} = t^k,\ x = ?,\ dx = ?,$
4. $a > 0,\ \sqrt{ax^2+bx+c} = \sqrt{a}x \pm t,\ ax^2+bx+c = ax^2 \pm 2\sqrt{a}xt + t^2,\ x = ?,\ dx = ?\ \sqrt{ax^2+bx+c} = ?$
5. $c > 0,\ \sqrt{ax^2+bx+c} = \sqrt{c} \pm xt,\ ax^2+bx+c = c \pm 2\sqrt{c}xt + x^2t^2,\ x = ?,\ dx = ?\ \sqrt{ax^2+bx+c} = ?$