MATEMĀTISKĀ ANALĪZE

Atvasināšanas formulas

1. $\boldsymbol{k' = 0}$, kur $k \in \mathbb{R}$ — konstante,
2. $\boldsymbol{(x^n)' = nx^{n-1}}$, $n \in \mathbb{R}$,
3. $\boldsymbol{(\sin x)' = \cos x}$,
4. $\boldsymbol{(\cos x)' = -\sin x}$,
5. $\boldsymbol{(\operatorname{tg} x)' = \dfrac{1}{\cos^2 x}}$,
6. $\boldsymbol{(\operatorname{ctg} x)' = -\dfrac{1}{\sin^2 x}}$,
7. $\boldsymbol{(a^x)' = a^x \ln a}$, $a > 0$,
8. $\boldsymbol{(\log_a x)' = \dfrac{1}{x \ln a}}$, $a > 0$, $a \neq 1$,
9. $\boldsymbol{(\ln x)' = \dfrac{1}{x}}$,
10. $\boldsymbol{(e^x)' = e^x}$,
11. $\boldsymbol{(\operatorname{arcsin} x)' = \frac{1}{\sqrt{1-x^2}}}$,
12. $\boldsymbol{(\arccos x)' = -\frac{1}{\sqrt{1-x^2}}}$,
13. $\boldsymbol{(\operatorname{arctg} x)' = \frac{1}{1+x^2}}$,
14. $\boldsymbol{(\operatorname{arcctg} x)' = -\frac{1}{1+x^2}}$.

Atvasināšanas likumi

1. $\boldsymbol{(kf(x))' = kf'(x)}$,
2. $\boldsymbol{(f(x) + g(x))' = f'(x) + g'(x)}$,
   $\boldsymbol{(f(x) - g(x))' = f'(x) - g'(x)}$,
3. $\boldsymbol{(f(x) \cdot g(x))' = f'(x) \cdot g(x) + f(x) \cdot g'(x)}$,
4. $\boldsymbol{\left(\dfrac{f(x)}{g(x)}\right)' = \dfrac{f'(x) \cdot g(x) - f(x) \cdot g'(x)}{g^2(x)}}$.

Nenoteikto integrāļu formulas

1. $\boldsymbol{\int x^n\,dx = \dfrac{x^{n+1}}{n+1} + C}$,
2. $\boldsymbol{\int \dfrac{dx}{x} = \ln|x| + C}$,
3. $\boldsymbol{\int \sin x\,dx = -\cos x + C}$,
4. $\boldsymbol{\int \cos x\,dx = \sin x + C}$,
5. $\boldsymbol{\int \dfrac{dx}{\cos^2 x} = \operatorname{tg} x + C}$,
6. $\boldsymbol{\int \dfrac{dx}{\sin^2 x} = -\operatorname{ctg} x + C}$,
7. $\boldsymbol{\int a^x dx = \dfrac{a^x}{\ln a} + C}$, $\boldsymbol{a > 0,\ a \neq 1}$
8. $\boldsymbol{\int e^x dx = e^x + C}$,
9. $\boldsymbol{\int \dfrac{dx}{\sqrt{1-x^2}} = \arcsin x + C = -\arccos x + C}$,
10. $\boldsymbol{\int \dfrac{dx}{1+x^2} = \operatorname{arctg} x + C}$,
11. $\boldsymbol{\int \dfrac{dx}{a^2+x^2} = \dfrac{1}{|a|} \operatorname{arctg} \dfrac{x}{|a|} + C}$, $\boldsymbol{a \neq 0}$.

Lineārā substitūcija: $\boldsymbol{\int f(ax+b)\,dx = \frac{1}{a}F(ax+b) + C}$

Substitūcijas metode:
$\boldsymbol{\int f(\phi(x))\phi'(x)\,dx = \int f(t)\,dt = F(t) + C = F(\phi(x)) + C}$

Parciālās integrēšanas metode: $\boldsymbol{\int u\,dv = uv - \int v\,du}$

Dažas trigonometrijas formulas

$$\sin^2 x + \cos^2 x = 1, \qquad \sin 2x = 2\sin x \cos x,$$
$$\cos 2x = \cos^2 x - \sin^2 x = 1 - 2\sin^2 x = 2\cos^2 x - 1$$