DERIVÁLÁS ($c, \alpha, a \in \mathbf{R}$)

$(c)' = 0$	$(x^{\alpha})' = \alpha \cdot x^{\alpha-1}$
$(\sin x)' = \cos x$	$(\cos x)' = -\sin x$
$(\operatorname{tg} x)' = \frac{1}{\cos^2 x}$	$(\operatorname{ctg} x)' = -\frac{1}{\sin^2 x}$
$(\arcsin x)' = \frac{1}{\sqrt{1-x^2}}$	$(\arccos x)' = -\frac{1}{\sqrt{1-x^2}}$
$(\operatorname{arctg} x)' = \frac{1}{1+x^2}$	$(\operatorname{arcctg} x)' = -\frac{1}{1+x^2}$
$(\ln x)' = \frac{1}{x}$	$(\log_a x)' = \frac{1}{x \cdot \ln a}$
$(e^x)' = e^x$	$(a^x)' = a^x \cdot \ln a$
$(\operatorname{sh} x)' = \operatorname{ch} x$	$(\operatorname{ch} x)' = \operatorname{sh} x$
$(\operatorname{th} x)' = \frac{1}{\operatorname{ch}^2 x}$	$(\operatorname{cth} x)' = \frac{-1}{\operatorname{sh}^2 x}$

$(c \cdot f(x))' = c \cdot f'(x)$

$(f(x) \pm g(x))' = f'(x) \pm g'(x)$

$(f(x) \cdot g(x))' = f'(x) \cdot g(x) + f(x) \cdot g'(x)$

$$\left(\frac{f(x)}{g(x)}\right)' = \frac{f'(x) \cdot g(x) - f(x) \cdot g'(x)}{(g(x))^2}$$

$(f(g(x)))' = f'(g(x)) \cdot g'(x)$

KIEGÉSZITÉS

$\sin^2 x + \cos^2 x = 1$	$\operatorname{ch}^2 x - \operatorname{sh}^2 x = 1$
$\sin^2 x = \frac{1-\cos 2x}{2}$	$\operatorname{sh}^2 x = \frac{\operatorname{ch} 2x - 1}{2}$
$\cos^2 x = \frac{1+\cos 2x}{2}$	$\operatorname{ch}^2 x = \frac{\operatorname{ch} 2x + 1}{2}$

$\sin 30^\circ = \cos 60^\circ = \frac{1}{2}$

$\cos 30^\circ = \sin 60^\circ = \frac{\sqrt{3}}{2}$

$\cos 45^\circ = \sin 45^\circ = \frac{\sqrt{2}}{2}$

INTEGRÁLÁS ($C, \alpha, a \in \mathbf{R}$)

$\int x^{\alpha}\, dx = \frac{x^{\alpha+1}}{\alpha+1} + C, \quad \alpha \neq -1$	$\int \frac{1}{x}\, dx = \ln\lvert x \rvert + C$
$\int e^x\, dx = e^x + C$	$\int a^x\, dx = \frac{a^x}{\ln a} + C$
$\int \sin x\, dx = -\cos x + C$	$\int \cos x\, dx = \sin x + C$
$\int \frac{1}{\sin^2 x}\, dx = -\operatorname{ctg} x + C$	$\int \frac{1}{\cos^2 x}\, dx = \operatorname{tg} x + C$
$\int \frac{1}{\sqrt{1-x^2}}\, dx = \arcsin x + C$	$\int \frac{1}{1+x^2}\, dx = \operatorname{arctg} x + C$
$\int \operatorname{sh} x\, dx = \operatorname{ch} x + C$	$\int \operatorname{ch} x\, dx = \operatorname{sh} x + C$
$\int \frac{1}{\operatorname{sh}^2 x} dx = -\operatorname{cth} x + C$	$\int \frac{1}{\operatorname{ch}^2 x} dx = \operatorname{th} x + C$
$\int \frac{1}{1-x^2} dx = \frac{1}{2} \cdot \ln \left\lvert \frac{1+x}{1-x} \right\rvert + C$	

$\int c \cdot f(x)\, dx = c \cdot \int f(x)\, dx$

$\int (f(x) \pm g(x))\, dx = \int f(x)\, dx \pm \int g(x)\, dx$

$\int f'(x) \cdot g(x)\, dx = f(x) \cdot g(x) - \int f(x) \cdot g'(x)\, dx$

$$\int f(ax+b)\, dx = \frac{F(ax+b)}{a} + C, \quad a \neq 0$$

$$\int (f(x))^{\alpha} \cdot f'(x)\, dx = \frac{(f(x))^{\alpha+1}}{\alpha+1} + C, \quad \alpha \neq -1$$

$$\int \frac{f'(x)}{f(x)}\, dx = \ln\lvert f(x) \rvert + C$$

$V = \pi \cdot \int_a^b (f(x))^2\, dx$	$s = \int_a^b \sqrt{1 + (f'(x))^2}\, dx$

$t = \operatorname{tg} \frac{x}{2}$ *helyettesítésnél:*

$\sin x = \frac{2t}{1+t^2}, \quad \cos x = \frac{1-t^2}{1+t^2}, \quad dx = \frac{2}{1+t^2}\, dt$

A képletgyűjteményt az ÓE KVK MTI matematikatanárai készítették hallgatóiknak.

LAPLACE-TRANSZFORMÁCIÓ	
1	$\frac{1}{s}$
e^{at}	$\frac{1}{s-a}$
$\sin at$	$\frac{a}{s^2+a^2}$
$\cos at$	$\frac{s}{s^2+a^2}$
$\operatorname{sh} at$	$\frac{a}{s^2-a^2}$
$\operatorname{ch} at$	$\frac{s}{s^2-a^2}$
t^n	$\frac{n!}{s^{n+1}}$
$e^{at}\cdot f(t)$	$\overline{f}(s-a)$
y'	$s\cdot\overline{y}-y(0)$
y''	$s^2\cdot\overline{y}-s\cdot y(0)-y'(0)$

TAYLOR-SOROK
$f(x)\to T(x)=\sum_{n=0}^{\infty}\frac{f^{(n)}(x_0)}{n!}(x-x_0)^n$, ha $\lvert x-x_0\rvert<R$
$e^x=\sum_{n=0}^{\infty}\frac{x^n}{n!}$
$\sin x=\sum_{n=0}^{\infty}(-1)^n\frac{x^{2n+1}}{(2n+1)!}$
$\cos x=\sum_{n=0}^{\infty}(-1)^n\frac{x^{2n}}{(2n)!}$
$\frac{1}{1-x}=\sum_{n=0}^{\infty}x^n$, ha $\lvert x\rvert<1$
$(1+x)^\alpha=\sum_{n=0}^{\infty}\binom{\alpha}{n}\cdot x^n$, ha $\lvert x\rvert<1$ $\binom{\alpha}{0}=1,\ \binom{\alpha}{n}=\frac{\alpha\cdot(\alpha-1)\cdot\ldots\cdot(\alpha-n+1)}{n!}$

VALÓSZINŰSÉGSZÁMITÁS	
Binomiális eloszlás: $p_k=\binom{n}{k}\cdot p^k(1-p)^{n-k}\ \ (k=0,1,2,\ldots,n)$	
Poisson eloszlás: $p_k=\frac{\lambda^k}{k!}e^{-\lambda}\ \ (k=0,1,2,\ldots)$	
Egyenletes eloszlás: $F(x)=\begin{cases}0, & ha\ x<a,\\ \frac{x-a}{b-a}, & ha\ a\le x<b,\\ 1, & ha\ x\ge b.\end{cases}$	
Exponenciális eloszlás: $F(x)=\begin{cases}0, & ha\ x<0\\ 1-e^{-\lambda x}, & ha\ x\ge 0\end{cases}$	
Normális eloszlás: $F(x)=\Phi\left(\frac{x-m}{\sigma}\right)$, *ahol F(x) az N(m;σ) ill.* *Φ(x) az N(0;1) eloszlás eloszlásfüggvénye*	
$M(x)=\sum_k p_k x_k$	$D^2(x)=\sum_k p_k x_k^2-\left(\sum_k p_k x_k\right)^2$
$M(x)=\int_{-\infty}^{+\infty}x\cdot f(x)dx$	$D^2(x)=\int_{-\infty}^{+\infty}x^2\cdot f(x)dx-\left(\int_{-\infty}^{+\infty}x\cdot f(x)dx\right)^2$

FOURIER-SOROK
$f(x)=f(x+T),\ \ \omega=\frac{2\pi}{T}$ $f(x)\to F(x)=$ $=a_0+\sum_{n=1}^{\infty}a_n\cdot\cos(n\omega x)+b_n\cdot\sin(n\omega x)$ $a_0=\frac{1}{T}\int_a^{a+T}f(x)\,dx$ $a_n=\frac{2}{T}\int_a^{a+T}f(x)\cdot\cos(n\omega x)\ dx$ $b_n=\frac{2}{T}\int_a^{a+T}f(x)\cdot\sin(n\omega x)\ dx$