NEVEZETES FÜGGVÉNYEK DERIVÁLTJAI

\mathcal{D}_f és \mathcal{D}_f'	f(x)	f'(x)	f grafikonja
\mathbb{R}	c $(c \in \mathbb{R})$	0	$ \begin{array}{c c} & y \\ \hline & c \\ \hline & 0 & \xrightarrow{x} \end{array} $
\mathbb{R}	x	1	
$\mathbb R$	x^n $(n \in \mathbb{N})$	nx^{n-1}	$ \begin{array}{c c} y \\ \hline 0 & x \\ n = 2k \ (k \in \mathbb{N}^+) \end{array} $ $ \begin{array}{c c} y \\ \hline 0 & x \\ n = 2k + 1 \\ (k \in \mathbb{N}^+) \end{array} $
$\mathbb{R}\setminus\{0\}$	$x^{-1} := \frac{1}{x}$	$-x^{-2} = -\frac{1}{x^2}$	$ \begin{array}{c} y \\ 0 \\ \end{array} $
$\mathbb{R}\setminus\{0\}$	$x^{-n} := \frac{1}{x^n}$ $(n \in \mathbb{N}^+)$	$-nx^{-n-1}$ $= -\frac{n}{x^{n+1}}$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$
$\mathcal{D}_f = [0, +\infty)$ $\mathcal{D}_f' = (0, +\infty)$	$x^{1/2} := \sqrt{x}$	$\frac{1}{2}x^{-1/2} = \frac{1}{2\sqrt{x}}$	
$\mathcal{D}_f = \mathbb{R}$ $\mathcal{D}'_f = \mathbb{R} \setminus \{0\}$	$x^{1/3} := \sqrt[3]{x}$	$\frac{1}{3}x^{-2/3} = \frac{1}{3\sqrt[3]{x^2}}$	$ \begin{array}{c} y \\ 1 \\ -1 \\ \downarrow \\ 1 \end{array} $
Ha n páros: $\mathcal{D}_f = [0 + \infty)$. Ha n páratlan: $\mathcal{D}_f = \mathbb{R}$. $\mathcal{D}_f' = \mathcal{D}_f \setminus \{0\}$	$x^{1/n} := \sqrt[n]{x}$ $(2 \le n \in \mathbb{N})$	$=\frac{1}{n}x^{1/n-1}$ $=\frac{1}{n\sqrt[n]{x^{n-1}}}$	$y \downarrow \qquad \qquad y \downarrow \qquad \qquad \downarrow \qquad \downarrow \qquad \downarrow \qquad \downarrow \qquad \downarrow \qquad \downarrow \qquad $

\mathcal{D}_f és \mathcal{D}_f'	f(x)	f'(x)	f grafikonja
$(0, +\infty)$	$x^{\alpha} := \exp(\alpha \ln x)$ $(\alpha \in \mathbb{R})$	$\alpha x^{\alpha-1}$	$y \cap \alpha > 1$ $0 < \alpha < 1$ $0 < \alpha < 1$ $0 < \alpha < 1$
\mathbb{R}	$e^{x} := \exp(x)$ $:= \sum_{n=0}^{+\infty} \frac{x^{n}}{n!}$	e^x	$ \begin{array}{c} y \\ e \\\\ 0 \\ 1 \end{array} $
$\mathbb R$	$a^{x} := \exp_{a}(x)$ $:= \exp(x \ln a)$ $(a \in (0, +\infty))$	$a^x \ln a$	$ \begin{array}{c c} & y \\ \hline & a = 1 \\ \hline & 0 < a < 1 \\ \hline & x \end{array} $
$(0, +\infty)$	$\ln x := \exp^{-1}(x)$	$\frac{1}{x}$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$
$(0, +\infty)$	$\log_a x := \exp_a^{-1}(x)$ $(\alpha \in \mathbb{R} \setminus \{1\})$	$\frac{1}{x \ln a}$	y 0 1 $0 < a < 1$
\mathbb{R}	$\sin x \\ := \sum_{n=0}^{+\infty} \frac{(-1)^n x^{2n+1}}{(2n+1)!}$	$\cos x$	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$
$\mathbb R$	$\cos x$ $:= \sum_{n=0}^{+\infty} \frac{(-1)^n x^{2n}}{(2n)!}$	$-\sin x$	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$
$\mathbb{R}\backslash \{\tfrac{\pi}{2} + k\pi \mid k \in \mathbb{Z}\}$	$\operatorname{tg} x := \frac{\sin x}{\cos x}$	$\frac{1}{\cos^2 x}$	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$

\mathcal{D}_f és \mathcal{D}_f'	f(x)	f'(x)	f grafikonja
$\mathbb{R}\setminus\{k\pi\mid k\in\mathbb{Z}\}$	$\operatorname{ctg} x := \frac{\cos x}{\sin x}$	$-\frac{1}{\sin^2 x}$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$
$\mathcal{D}_f = [-1, 1]$ $\mathcal{D}'_f = (-1, 1)$	$\arcsin x$ $:= \left(\sin _{\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]}\right)^{-1}(x)$	$\frac{1}{\sqrt{1-x^2}}$	$ \begin{array}{c c} y & & \text{arc sin} \\ 1 & & & \text{sin} \\ -\frac{\pi}{2} - 1 & & & \text{sin} \\ 0 & 1 & \frac{\pi}{2} & x \end{array} $
$\mathcal{D}_f = [-1, 1]$ $\mathcal{D}'_f = (-1, 1)$	$\arccos x$ $:= \left(\cos _{[0,\pi]}\right)^{-1}(x)$	$-\frac{1}{\sqrt{1-x^2}}$	$ \begin{array}{c} $
\mathbb{R}	$\arctan \operatorname{tg} x$ $:= \left(\operatorname{tg} _{\left(-\frac{\pi}{2}, \frac{\pi}{2}\right)}\right)^{-1}(x)$	$\frac{1}{1+x^2}$	$ \begin{array}{c c} y & \text{tg} \\ \hline\frac{\pi}{2} & \text{arctg} \\ \hline 0 & \frac{\pi}{2} & x \\ \hline\frac{\pi}{2} &\frac{\pi}{2} & \end{array} $
\mathbb{R}	$\operatorname{arc} \operatorname{ctg} x$ $:= \left(\operatorname{ctg} _{(0,\pi)}\right)^{-1}$	$-\frac{1}{1+x^2}$	$\frac{y}{\pi}$ $\frac{z}{\pi}$ $0 \frac{\pi}{2} \pi \mid x$
$\mathbb R$	$sh x := \frac{e^x - e^{-x}}{2}$ $= \sum_{n=0}^{+\infty} \frac{x^{2n+1}}{(2n+1)!}$	$\operatorname{ch} x$	
$\mathbb R$	ch $x := \frac{e^x + e^{-x}}{2}$ $= \sum_{n=0}^{+\infty} \frac{x^{2n}}{(2n)!}$	$\operatorname{sh} x$	

\mathcal{D}_f és \mathcal{D}_f'	f(x)	f'(x)	f grafikonja
$\mathbb R$	$ th x := \frac{\sinh x}{\cosh x} $	$\frac{1}{\cosh^2 x}$	$ \begin{array}{c c} y \\ 1 \\ \hline 0 \\ 1 \end{array} $
$\mathbb{R}\setminus\{0\}$	$ cth x := \frac{ch x}{sh x} $	$-\frac{1}{\sinh^2 x}$	$ \begin{array}{c c} & y \\ & 1 \\ \hline & 0 & 1 \\ \hline & -1 \\ \end{array} $
$\mathbb R$	$ar \operatorname{sh} x := \operatorname{sh}^{-1} x$ $= \ln \left(x + \sqrt{x^2 + 1} \right)$	$\frac{1}{\sqrt{x^2+1}}$	$ \begin{array}{c} y \\ & \text{sh}/\\ & \text{arsh} \\ & 0 \\ & 1 \end{array} $
$\mathcal{D}_f = [1, +\infty)$ $\mathcal{D}'_f = (1, +\infty)$	$\operatorname{arch} x :=$ $= \left(\operatorname{ch} _{[0,+\infty)}\right)^{-1}(x)$ $= \ln\left(x + \sqrt{x^2 - 1}\right)$	$\frac{1}{\sqrt{x^2 - 1}}$	y ch arch x
(-1,1)	$ar th x := th^{-1} x$ $= \frac{1}{2} \cdot \ln \left(\frac{1+x}{1-x} \right)$	$\frac{1}{1-x^2}$	
$(-\infty, -1) \cup (1, +\infty)$	$\operatorname{arcth} x$ $:= \operatorname{cth}^{-1} x$ $= \frac{1}{2} \cdot \ln \left(\frac{x+1}{x-1} \right)$	$\frac{1}{1-x^2}$	