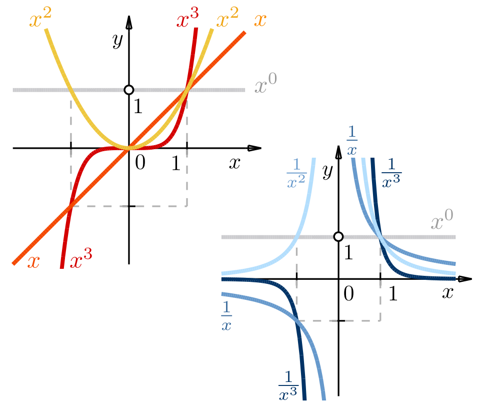
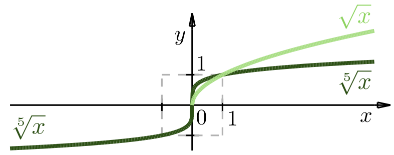
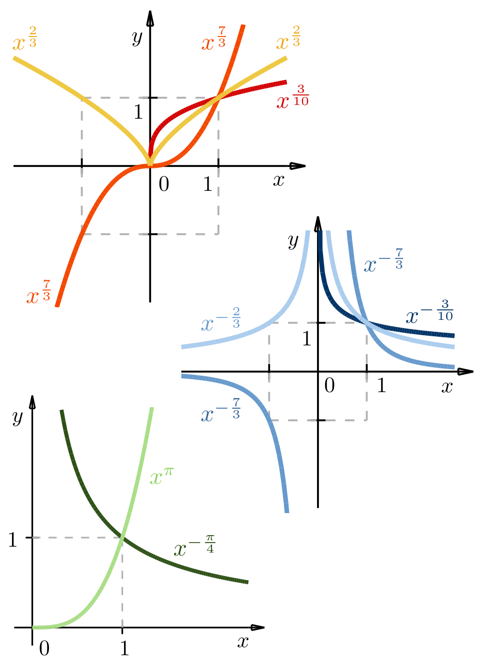
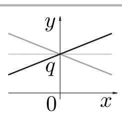
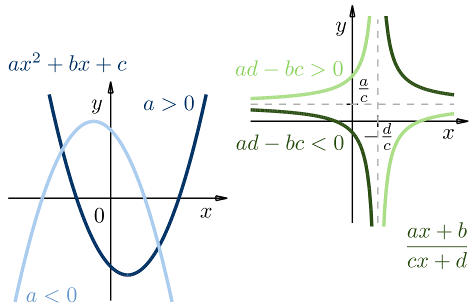
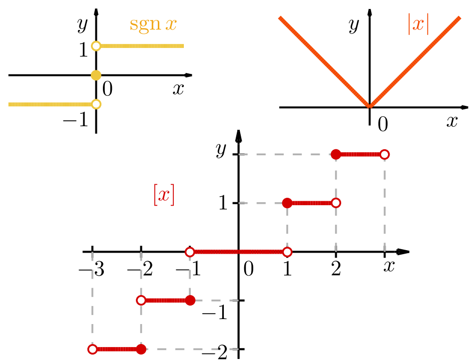
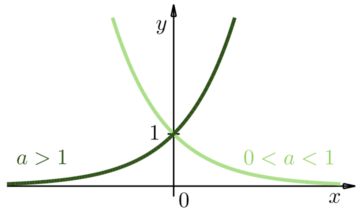
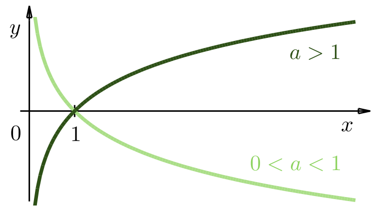
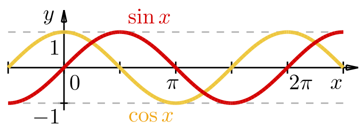
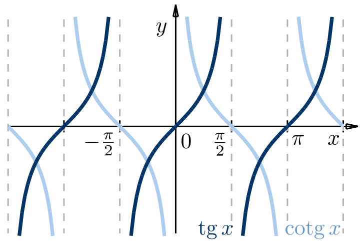
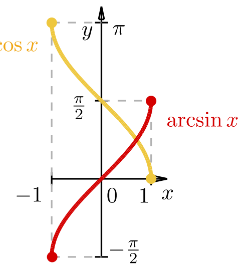
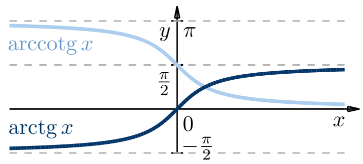
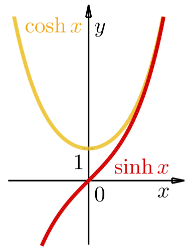
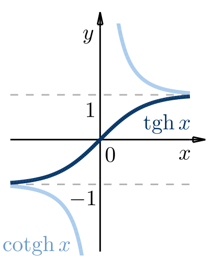
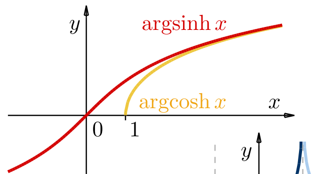
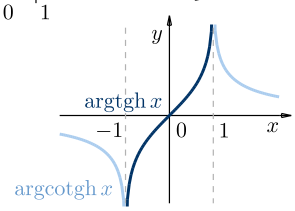
List of basic elementary functions

	function	condition		$D(f)$	$H(f)$	note	graph of function f	$D(f')$	derivative f'
power function with integer exponent	$f\colon y=x^0$			$\mathbf{R}\setminus\{0\}$	$\{1\}$			$\mathbf{R}\setminus\{0\}$	$f'(x)=0$
	$f\colon y=x^n$	$n\in\mathbf{N}$	even n sudé	$\mathbf{R}$	$\langle 0,+\infty)$	even		$\mathbf{R}$	$f'(x)=nx^{n-1}$
			odd n liché	$\mathbf{R}$	$\mathbf{R}$	odd		$\mathbf{R}$	
	$f\colon y=x^{-n}$	$n\in\mathbf{N}$	even n sudé	$\mathbf{R}\setminus\{0\}$	$(0,+\infty)$	even		$\mathbf{R}\setminus\{0\}$	$f'(x)=-nx^{-n-1}$
			odd n liché	$\mathbf{R}\setminus\{0\}$	$\mathbf{R}\setminus\{0\}$	odd		$\mathbf{R}\setminus\{0\}$	
n-th root function	$f\colon y=\sqrt[n]{x}$	$n\in\mathbf{N}$	even n sudé	$\langle 0,+\infty)$	$\langle 0,+\infty)$			$(0,+\infty)$	$f'(x)=\frac{1}{n}x^{\frac{1}{n}-1}$
			odd n liché	$\mathbf{R}$	$\mathbf{R}$	odd		$\mathbf{R}\setminus\{0\}$	
power function with any exponent	$f\colon y=x^{\frac{m}{n}}$	$m,n\in\mathbf{N}$	even m sudé, odd n liché	$\mathbf{R}$	$\langle 0,+\infty)$	even		$\mathbf{R}\setminus\{0\}$ ($\mathbf{R}$ pro $m\geq n$)	$f'(x)=\frac{m}{n}x^{\frac{m}{n}-1}$
			odd m liché, odd n liché	$\mathbf{R}$	$\mathbf{R}$	odd		$\mathbf{R}\setminus\{0\}$ ($\mathbf{R}$ pro $m\geq n$)	
			odd m liché, even n sudé	$\langle 0,+\infty)$	$\langle 0,+\infty)$			$(0,+\infty)$	
	$f\colon y=x^{-\frac{m}{n}}$	$m,n\in\mathbf{N}$	even m sudé, odd n liché	$\mathbf{R}\setminus\{0\}$	$(0,+\infty)$	even		$\mathbf{R}\setminus\{0\}$	$f'(x)=-\frac{m}{n}x^{-\frac{m}{n}-1}$
			odd m liché, odd n liché	$\mathbf{R}\setminus\{0\}$	$\mathbf{R}\setminus\{0\}$	odd		$\mathbf{R}\setminus\{0\}$	
			odd m liché, even n sudé	$(0,+\infty)$	$(0,+\infty)$			$(0,+\infty)$	
	$f\colon y=x^a$	$a\in\mathbf{R}\setminus\mathbf{Q}$	$a>0$	$\langle 0,+\infty)$	$\langle 0,+\infty)$			$(0,+\infty)$	$f'(x)=ax^{a-1}$
			$a<0$	$(0,+\infty)$	$(0,+\infty)$			$(0,+\infty)$	
	constant fnc. $f\colon y=q$	 $k>0$, $k=0$, $k<0$		$\mathbf{R}$	$\{q\}$			$\mathbf{R}$	$f'(x)=0$
	linear fnc. $f\colon y=kx+q$	$k\neq 0$		$\mathbf{R}$	$\mathbf{R}$			$\mathbf{R}$	$f'(x)=k$
	quadratic fnc. $f\colon y=ax^2+bx+c$			$\mathbf{R}$				$\mathbf{R}$	$f'(x)=2ax+b$
	rational fnc. $f\colon y=\dfrac{ax+b}{cx+d}$	$c\neq 0$, $bc-ad\neq 0$		$\mathbf{R}\setminus\{-\frac{d}{c}\}$	$\mathbf{R}\setminus\{\frac{a}{c}\}$			$\mathbf{R}\setminus\{-\frac{d}{c}\}$	$f'(x)=\dfrac{ad-bc}{(cx+d)^2}$
	$f\colon y=\operatorname{sgn}x=\begin{cases}1, & x>0,\\ 0, & x=0,\\ -1, & x<0.\end{cases}$			$\mathbf{R}$	$\{-1,0,1\}$	odd			
	absolute value fnc. $f\colon y=\lvert x\rvert=\begin{cases}x, & x\geq 0,\\ -x, & x<0.\end{cases}$			$\mathbf{R}$	$\langle 0,+\infty)$	even			
	integer part fnc. $f\colon y=[x]$			$\mathbf{R}$	$\mathbf{Z}$	odd			

$f(x)^{g(x)}=\mathrm{e}^{g(x)\ln f(x)}$

Reálné funkce jedné reálné proměnné

	transcedent function	$D(f)$	$H(f)$	note	graph of f	$D(f')$	derivative f'
exponential function	$f\colon y = a^x,\quad a>0,\ a\neq 1$	$\mathbf{R}$	$(0,+\infty)$			$\mathbf{R}$	$f'(x) = a^x \ln a$
	$f\colon y = \mathrm{e}^x$						$f'(x) = \mathrm{e}^x$
	$\mathrm{e} \doteq 2{,}718281828$						
logarithmic function	$f\colon y = \log_a x,\quad a>0,\ a\neq 1$	$(0,+\infty)$	$\mathbf{R}$			$(0,+\infty)$	$f'(x) = \frac{1}{x\ln a}$
	$f\colon y = \log_{\mathrm{e}} x = \ln x$						$f'(x) = \frac{1}{x}$
	$f\colon y = \log_{10} x = \log x$						$f'(x) = \frac{1}{x\ln 10}$
trigonometric functions	$f\colon y = \sin x$	$\mathbf{R}$	$\langle -1,1\rangle$	period. $T=2\pi$ odd		$\mathbf{R}$	$f'(x) = \cos x$
	$f\colon y = \cos x$	$\mathbf{R}$	$\langle -1,1\rangle$	period. $T=2\pi$ even		$\mathbf{R}$	$f'(x) = -\sin x$
	$f\colon y = \mathrm{tg}\, x = \frac{\sin x}{\cos x}$ tan x	$\mathbf{R}\setminus\{(2k+1)\frac{\pi}{2},\ k\in\mathbf{Z}\}$	$\mathbf{R}$	period. $T=\pi$ odd		$\mathbf{R}\setminus\{(2k+1)\frac{\pi}{2},\ k\in\mathbf{Z}\}$	$f'(x) = \frac{1}{\cos^2 x}$
	$f\colon y = \mathrm{cotg}\, x = \frac{\cos x}{\sin x}$ cotan x	$\mathbf{R}\setminus\{k\pi,\ k\in\mathbf{Z}\}$	$\mathbf{R}$	period. $T=\pi$ odd		$\mathbf{R}\setminus\{k\pi,\ k\in\mathbf{Z}\}$	$f'(x) = \frac{-1}{\sin^2 x}$
cyclometric functions	$f\colon y = \arcsin x$	$\langle -1,1\rangle$	$\langle -\frac{\pi}{2},\frac{\pi}{2}\rangle$	odd		$(-1,1)$	$f'(x) = \frac{1}{\sqrt{1-x^2}}$
	$f\colon y = \arccos x$	$\langle -1,1\rangle$	$\langle 0,\pi\rangle$			$(-1,1)$	$f'(x) = \frac{-1}{\sqrt{1-x^2}}$
	$f\colon y = \mathrm{arctg}\, x$ arctan x	$\mathbf{R}$	$(-\frac{\pi}{2},\frac{\pi}{2})$	odd		$\mathbf{R}$	$f'(x) = \frac{1}{1+x^2}$
	$f\colon y = \mathrm{arccotg}\, x$ arccotan x	$\mathbf{R}$	$(0,\pi)$			$\mathbf{R}$	$f'(x) = \frac{-1}{1+x^2}$
hyperbolic functions	$f\colon y = \sinh x = \frac{\mathrm{e}^x-\mathrm{e}^{-x}}{2}$	$\mathbf{R}$	$\mathbf{R}$	lichá		$\mathbf{R}$	$f'(x) = \cosh x$
	$f\colon y = \cosh x = \frac{\mathrm{e}^x+\mathrm{e}^{-x}}{2}$	$\mathbf{R}$	$\langle 1,+\infty)$	sudá		$\mathbf{R}$	$f'(x) = \sinh x$
	$f\colon y = \mathrm{tgh}\, x = \frac{\sinh x}{\cosh x}$	$\mathbf{R}$	$(-1,1)$	lichá		$\mathbf{R}$	$f'(x) = \frac{1}{\cosh^2 x}$
	$f\colon y = \mathrm{cotgh}\, x = \frac{\cosh x}{\sinh x}$	$\mathbf{R}\setminus\{0\}$	$\mathbf{R}\setminus\langle -1,1\rangle$	lichá		$\mathbf{R}\setminus\{0\}$	$f'(x) = \frac{-1}{\sinh^2 x}$
hyperbolometric functions	$f\colon y = \mathrm{argsinh}\, x$	$\mathbf{R}$	$\mathbf{R}$	lichá		$\mathbf{R}$	$f'(x) = \frac{1}{\sqrt{1+x^2}}$
	$f\colon y = \mathrm{argcosh}\, x$	$\langle 1,+\infty)$	$\langle 0,+\infty)$			$(1,+\infty)$	$f'(x) = \frac{1}{\sqrt{x^2-1}}$
	$f\colon y = \mathrm{argtgh}\, x$	$(-1,1)$	$\mathbf{R}$	lichá		$(-1,1)$	$f'(x) = \frac{1}{1-x^2}$
	$f\colon y = \mathrm{argcotgh}\, x$	$\mathbf{R}\setminus\langle -1,1\rangle$	$\mathbf{R}\setminus\{0\}$	lichá		$\mathbf{R}\setminus\langle -1,1\rangle$	$f'(x) = \frac{1}{1-x^2}$