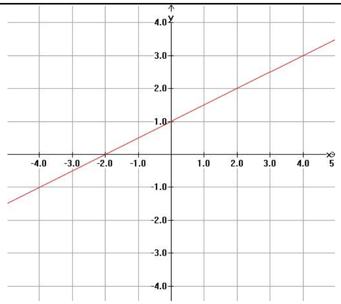
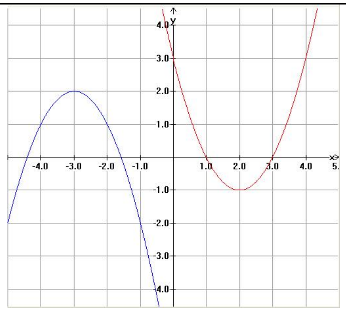
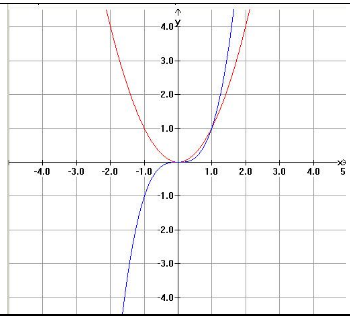
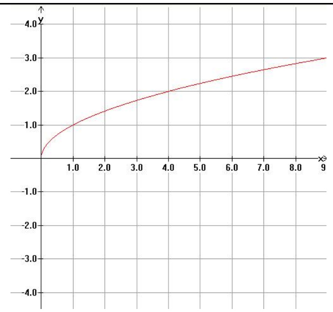
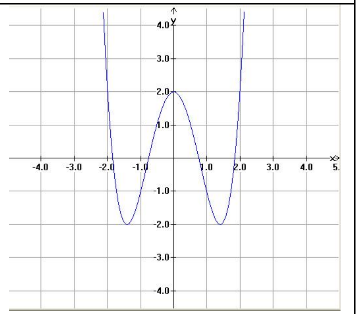
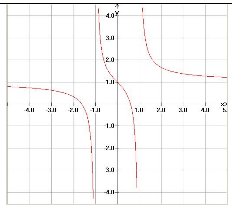
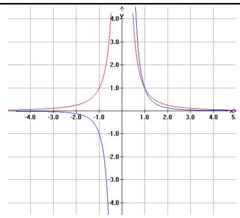
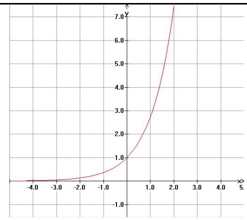
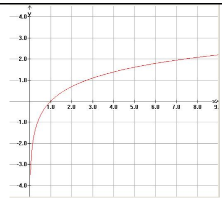
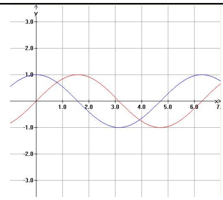
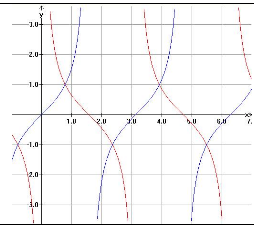
FUNKTIONSKATALOG

Funktion Eigenschaft	Lineare Funktion	Quadratische Funktion	Potenzfunktion	Wurzelfunktion	Ganzrationale Funktion
Gleichung	$f(x)=mx+n$ m-Anstieg n-Absolutglied	$f(x)=ax^2+bx+c$	$f(x)=x^n$ $n\in N^+$	$f(x)=\sqrt[n]{x}$ $n\in N^+$	$f(x)= a_nx^n + a_{n-1}x^{n-1} +\ldots + a_1x + a_0$
D(f)	R	R	R	$x\in R$, $x\geq 0$	R
Graph					
Nullstellen	max. 1 Nullstelle $x_0=-n/m$	max. 2 Nullstellen $x_{1,2}=-\frac{p}{2}\pm\sqrt{\frac{p^2}{4}-q}$	1 Nullstelle $x_0=0$	1 Nullstelle $x_0=0$	max. n Nullstellen
Ableitung	$f'(x)=m$	$f'(x)=2ax+b$	$f'(x)=nx^{n-1}$	$f'(x)=\frac{1}{n}\frac{1}{\sqrt[n]{x^{n-1}}}$	$f'(x)= na_nx^{n-1} + (n-1)a_{n-1}x^{n-2} +\ldots + a_1$
Extrema	keine	1 Extrempunkt Scheitelpunkt $\left(-\frac{b}{2a} \;/\; -\frac{b^2}{2a}+c\right)$	n gerade: 1 Extrempunkt n ungerade: 1 Sattelpunkt	Randextremum	max. (n-1) Extrempunkte

Funktion / Eigenschaft	Gebrochen-rationale Funktion	Hyperbel	Exponential-funktion	Logarithmus-funktion	Trigonometrische Funktionen	
Gleichung	$f(x)=z(x)/n(x)$ $z(x), n(x)\neq 0$ ganzrational	$f(x)=x^{-n}$	$f(x)=e^{x}$	$f(x)=\ln(x)$	$f(x)=\sin(x)$ $f(x)=\cos(x)$	$f(x)=\tan(x)$ $f(x)=\cot(x)$
D(f)	R, $n(x)\neq 0$	R, $x\neq 0$	R	$x\in R$, $x>0$	R	R, $x\neq \frac{1}{2}\pi+k\pi$ R, $x\neq k\pi$
Graph						
Nullstellen	x_n: $n(x_n)=0$			$x_n=1$	$x_n=k\pi$ $x_n=\frac{1}{2}\pi+k\pi$	$x_n=k\pi$ $x_n=\frac{1}{2}\pi+k\pi$
Ableitung	$f'(x)=\dfrac{z'(x)n(x)-z(x)n'(x)}{(n(x))^2}$	$f'(x)=(-n)\,x^{-n-1}$	$f'(x)=e^{x}$	$f'(x)=1/x$	$f'(x)=\cos(x)$ $f'(x)=-\sin(x)$	$f'(x)=1+\tan^2(x)$ $f'(x)=-(1+\cot^2(x))$
Polstellen	x_P: $n(x_P)=0$	$x_P=0$	keine	keine	keine keine	$x_P=\frac{1}{2}\pi+k\pi$ $x_P=k\pi$
Extrema	x_E: $z'(x_E)=0$	keine	keine	keine	$x_E=\frac{1}{2}\pi+k\pi$ $x_E=k\pi$	