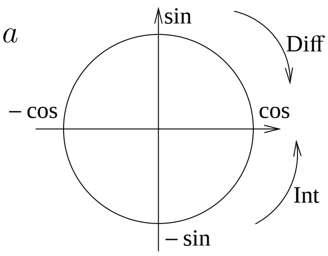
Note om differentiation af reelle funktioner

Differentialkvotienter af ofte benyttede funktioner

$f(x)$	$f'(x)$
k	0
$ax+b$	a
ax^2+bx+c	$2ax+b$
x^k	kx^{k-1}
$\sqrt{x}=x^{\frac{1}{2}}$	$\frac{1}{2\sqrt{x}}=\frac{1}{2}x^{-\frac{1}{2}}$
$\sqrt[n]{x}=x^{\frac{1}{n}}$	$\frac{\sqrt[n]{x}}{nx}=\frac{1}{n}x^{\frac{1}{n}-1}$
$\frac{1}{x}=x^{-1}$	$-\frac{1}{x^2}=-x^{-2}$
$\sin x$	$\cos x$
$\cos x$	$-\sin x$
$\tan x=\frac{\sin x}{\cos x}$	$1+\tan^2 x=1+(\tan x)^2=\frac{1}{\cos^2 x}=\frac{1}{(\cos x)^2}$
$\ln x$	$\frac{1}{x}$
$\exp x=e^x$	$\exp x=e^x$
$\exp kx=e^{kx}$	$k\exp kx=ke^{kx}$
$a^x=\exp(\ln a^x)=\exp(x\ln a)$	$\ln a\cdot\exp(x\ln a)=a^x\cdot\ln a$



Regneregler for differentiation

$$[f(x)\pm g(x)]'=f'(x)\pm g'(x)$$
$$[f(x)\cdot g(x)]'=f'(x)\cdot g(x)+f(x)\cdot g'(x)$$
$$[k\cdot f(x)]'=k\cdot f'(x)$$
$$\left[\frac{f(x)}{g(x)}\right]'=\frac{f'(x)g(x)-f(x)g'(x)}{[g(x)]^2}$$
$$g(f(x))'=g'(f(x))\cdot f'(x)$$

Ligning for tangent

Tangent til grafen for f(x) gennem punktet $(x_0, f(x_0))$:

$$y-f(x_0)=f'(x_0)(x-x_0)$$