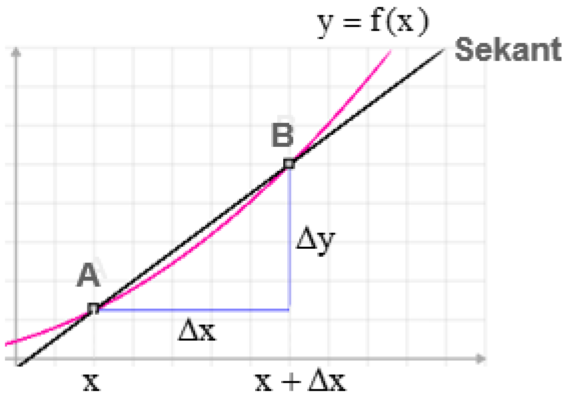
Derivasjon

Derivasjon omhandler studiet av endringer

Def

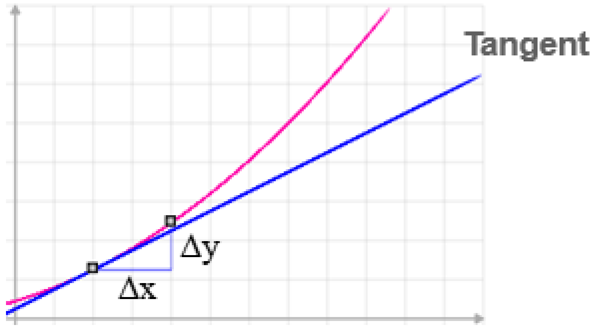
Stigningstallet til sekanten

$$\frac{\Delta y}{\Delta x} = \frac{f(x+\Delta x) - f(x)}{\Delta x}$$



Stigningstallet til tangenten

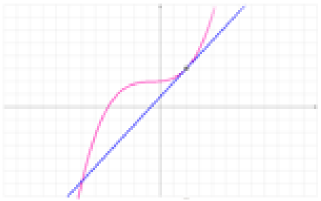
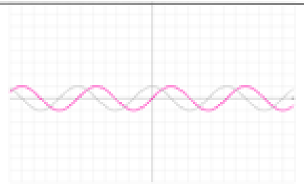
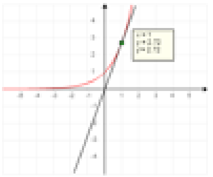
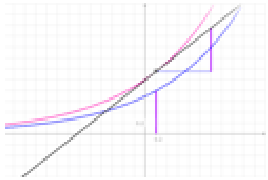
$$y'(x) = \frac{dy}{dx} = \lim_{\Delta x \to 0} \frac{\Delta y}{\Delta x} = \lim_{\Delta x \to 0} \frac{f(x+\Delta x) - f(x)}{\Delta x}$$



Den deriverte til funksjonen y = f(x) i punktet x er stigningstallet til tangenten i punktet (x,f(x))

Derivasjon

Regler

$y = c$ $y = ax^n$ $y = f \pm g$ $y = f \cdot g$ $y = \frac{f}{g} = f \cdot g^{-1}$	$\Rightarrow$ $\Rightarrow$ $\Rightarrow$ $\Rightarrow$ $\Rightarrow$	$y' = 0$ $y' = anx^{n-1}$ $y' = f' \pm g'$ $y'(x) = f'(x) \cdot g(x) + f(x) \cdot g'(x)$ $y' = f' \cdot g^{-1} - f \cdot g^{-2} \cdot g' = \frac{f' \cdot g - f \cdot g'}{g^2}$	
$y = \sin(x)$ $y = \cos(x)$ $y = \sinh(x)$ $y = \cosh(x)$	$\Rightarrow$ $\Rightarrow$ $\Rightarrow$ $\Rightarrow$	$y' = \cos(x)$ $y' = -\sin(x)$ $y' = \cosh(x)$ $y' = \sinh(x)$	
$y = e^x$	$\Rightarrow$	$y' = e^x$ 	

Hastighet:	$v(t) = \lim_{\Delta t \to 0} \frac{\Delta s}{\Delta t} = s'(t) = \dot{s}(t)$	
Akselerasjon:	$a(t) = \lim_{\Delta t \to 0} \frac{\Delta v}{\Delta t} = v'(t) = \dot{v}(t) = \ddot{s}(t)$