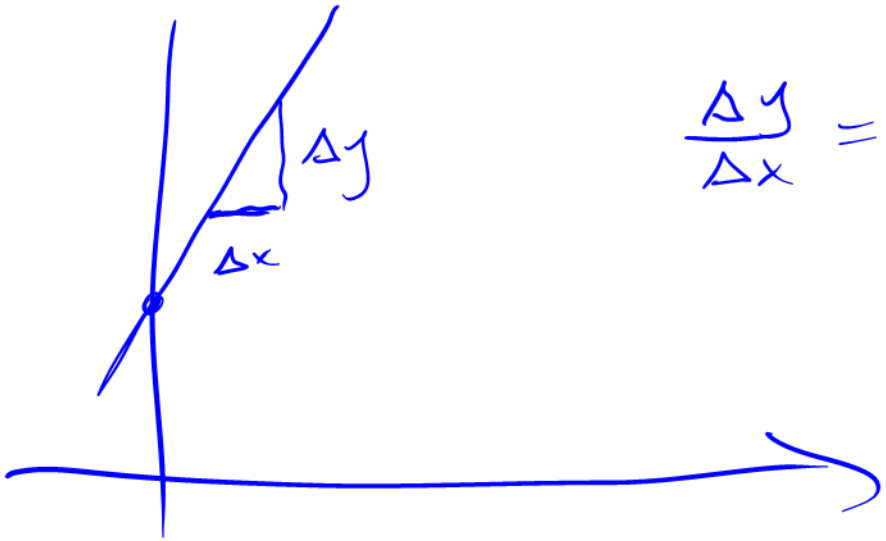
Matematik B Mandag 19/10 2015

- Fremmøderegistrering.
- Knæbøjning: ~~Fordoblings- og halveringskonstant~~ $f(x) = x^2 + x - 2$
- Nyt stof: Differentialregning.
  - Afledt funktion. (Differentialkvotient)
  - Bevisteknisk definition af f'(x) som grænseværdi af differenskvotient.
    - B2 side 57 + 59-62 (til eksempel 2.3)
    - BB>Filer>Supplerende noter>  Differentiation af grundfunktioner

LINEAR FUNCTION

$f(x) = 2x + 3$

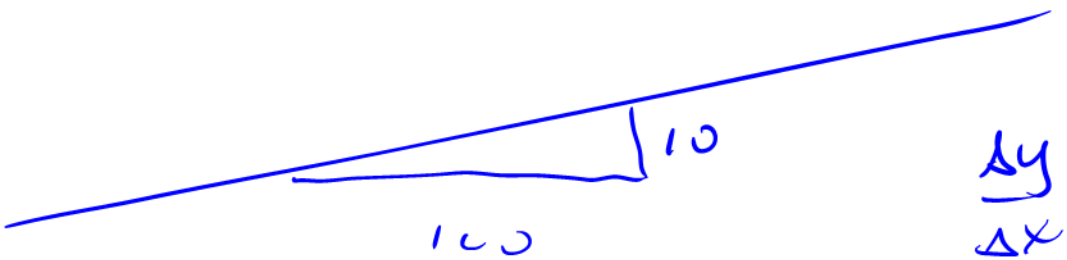


$$\frac{\Delta y}{\Delta x} = 2$$

$$f(x) = ax + b$$

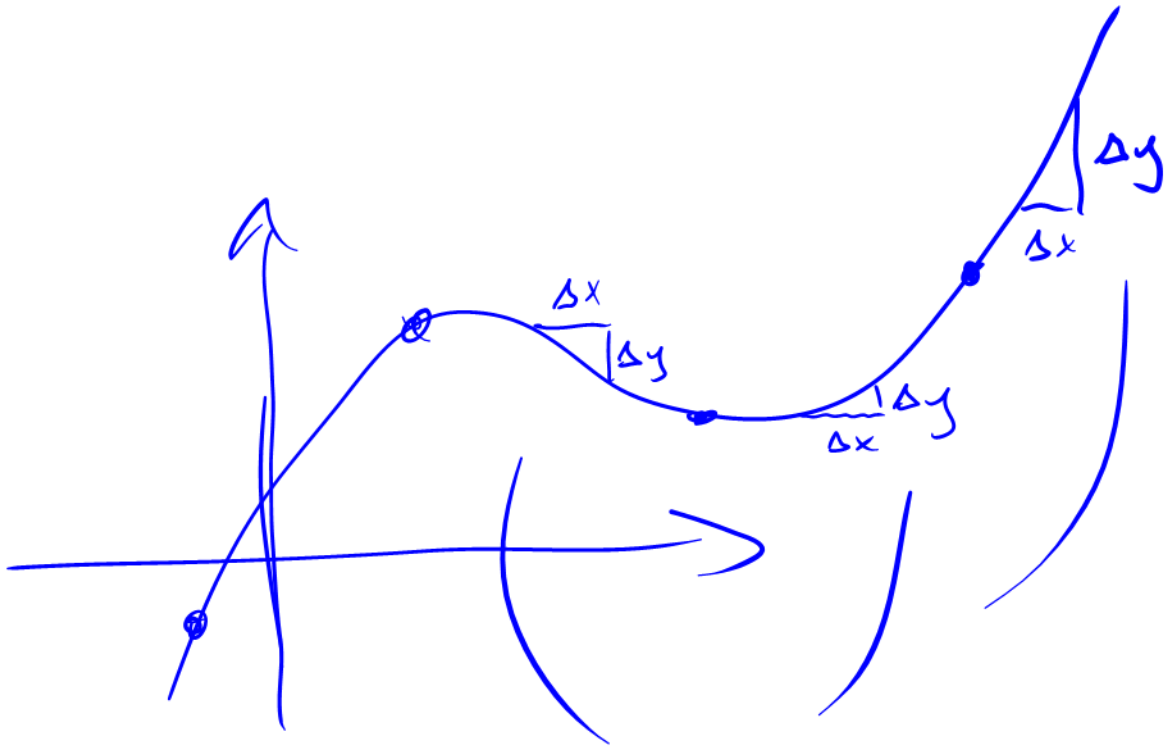
$$\frac{\Delta y}{\Delta x} = a$$

CRUCIAL

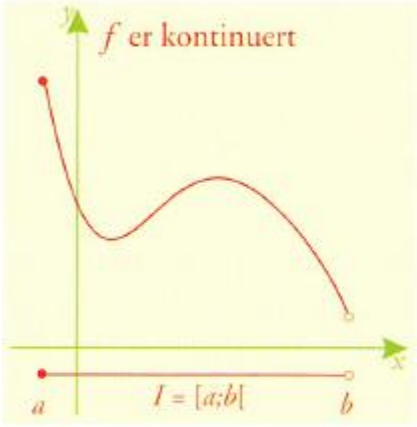


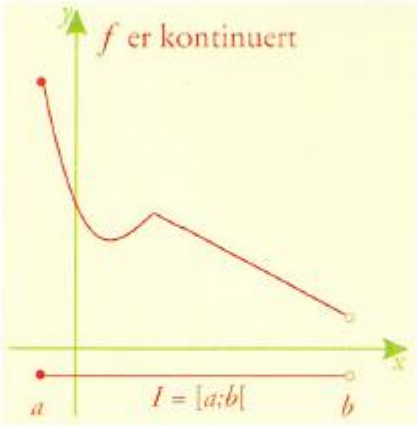
$$\frac{\Delta y}{\Delta x} = \frac{10}{100} = 0{,}10 = 10\%$$

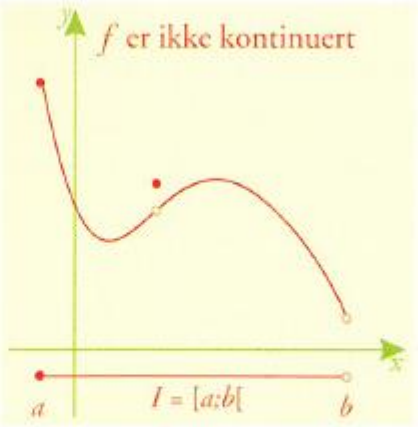
IKKE LINEÆR FUNKSJON

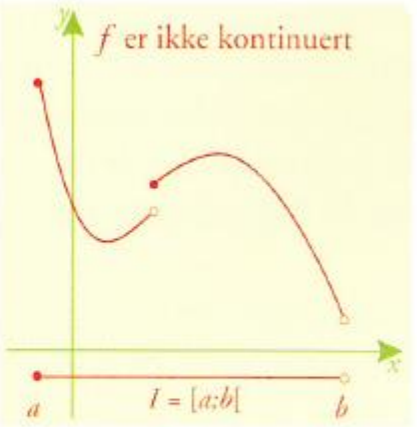


Jarskellige stigninge

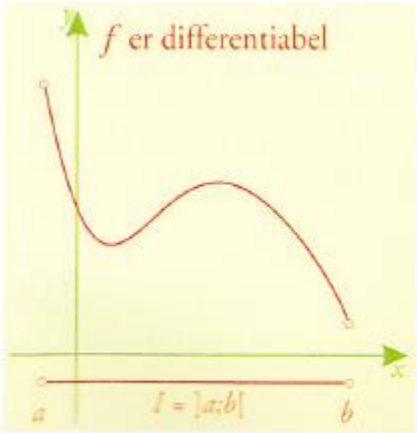


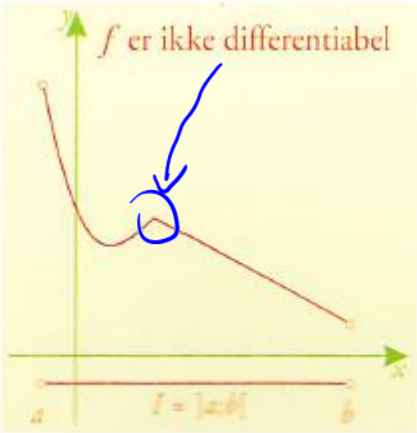


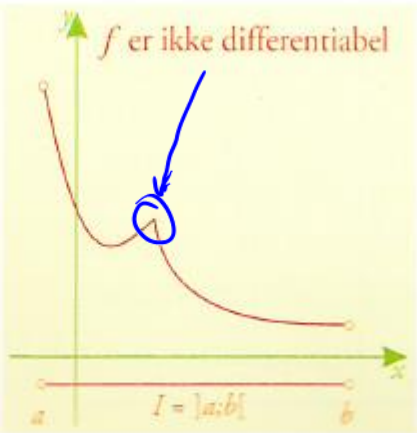


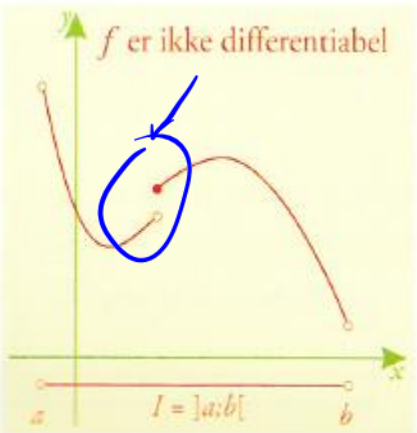


En funktion er kontinuert, når grafen er sammenhængende

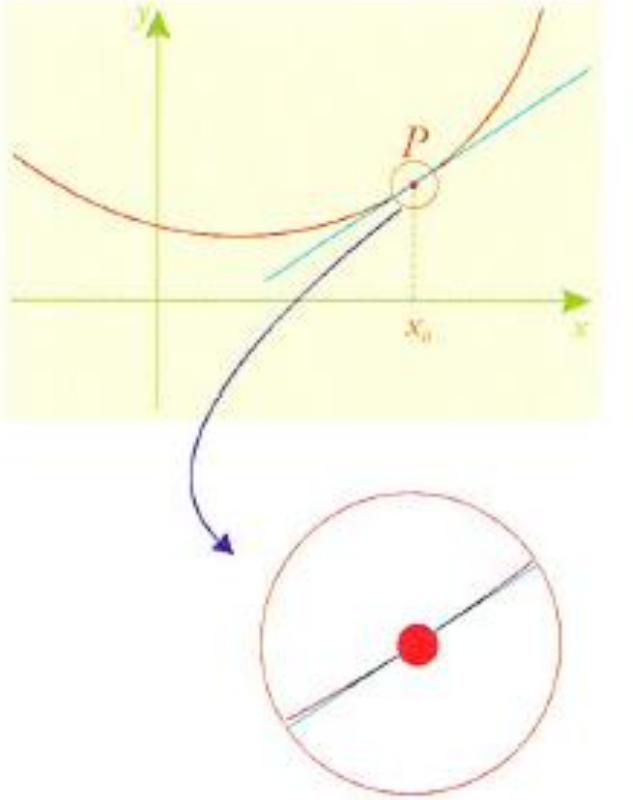




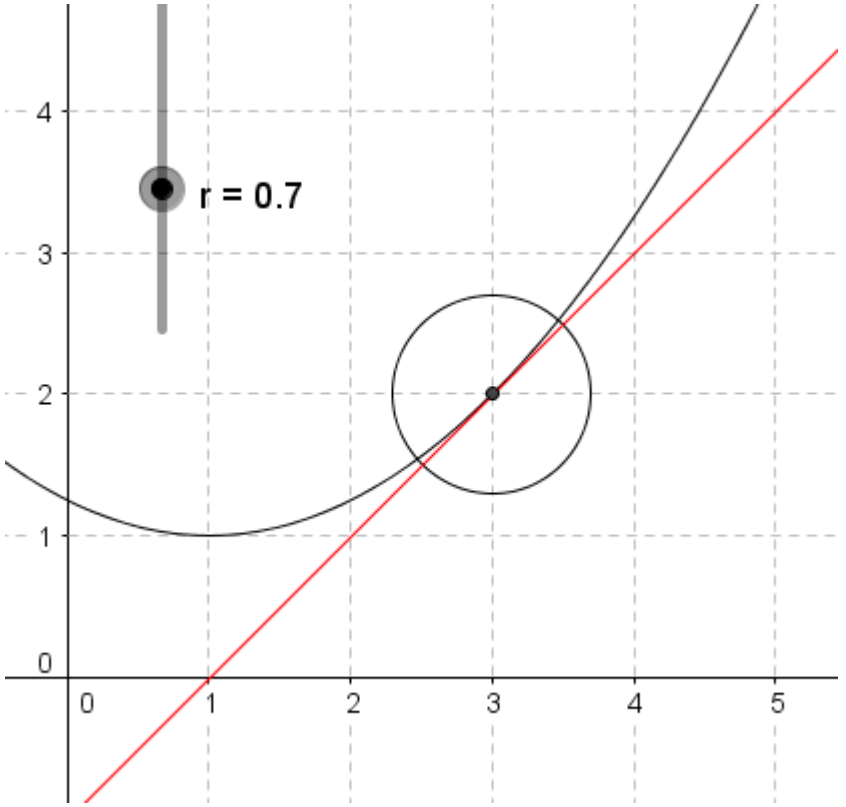




En funktion er populært sagt differentiabel, hvis dens graf er glat og sammenhængende. Dvs. uden huller, spring, knæk eller spidser.



Tangenten følger kurven tæt



Algebra vindue

Funktion

$f(x) = \sqrt{x^2 \ (x-3)^2} + x$

Keglesnit

c: $(x - 3)^2 + (y - 3)^2 = 0.5929$

Linje

d: $y = 0.5x + 1.5$

Numerisk

$a = 0.5$

$r = 0.77$

$x_0 = 3$

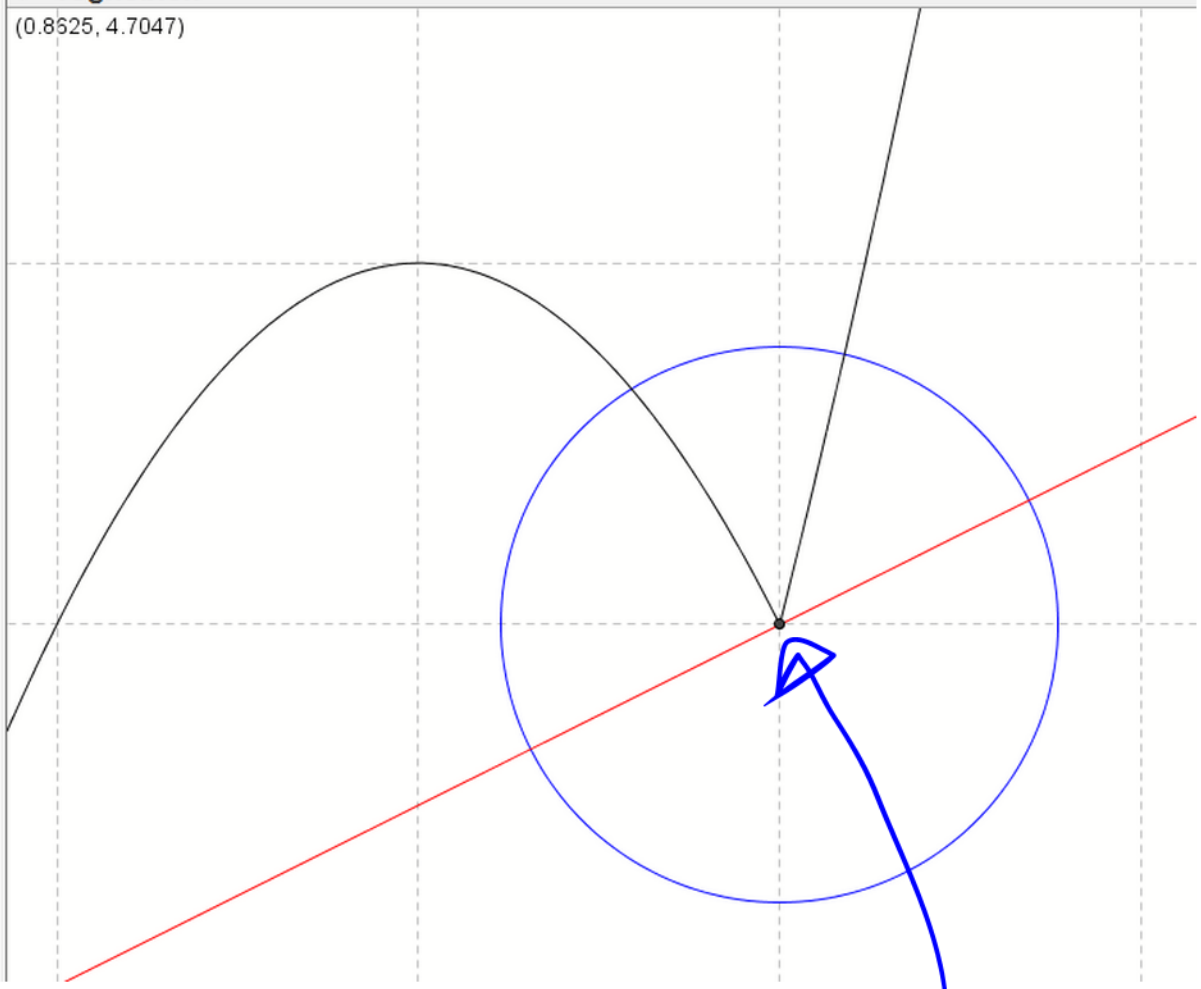
$y_0 = 3$

Punkt

P = (3, 3)

Tegneblok

(0.8625, 4.7047)



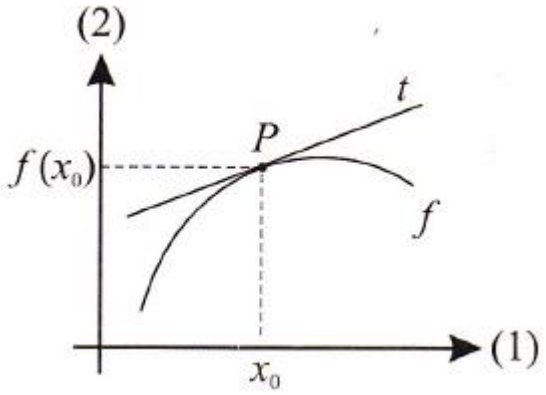
IKKE DIFFERENTIABEL I DETTE PUNKT

Differentialregning

Differentialkvotienten $f'(x_0)$ for funktionen f i tallet x_0

(118) $$f'(x_0) = \lim_{x \to x_0} \frac{f(x) - f(x_0)}{x - x_0}$$

$$= \lim_{h \to 0} \frac{f(x_0 + h) - f(x_0)}{h}$$



Δx	x-tilvækst	$\Delta x = x - x_0$
$\Delta y, \Delta f$	funktionstilvækst for $y = f(x)$	$\Delta y = \Delta f = f(x) - f(x_0)$
$\frac{\Delta y}{\Delta x}, \frac{\Delta f}{\Delta x}$	differenskvotient for $y = f(x)$	$\frac{\Delta y}{\Delta x} = \frac{\Delta f}{\Delta x} = \frac{f(x) - f(x_0)}{x - x_0}$
$f'(x_0)$	differentialkvotienten for $y = f(x)$ i x_0	$f'(x_0) = \lim_{x \to x_0} \frac{f(x) - f(x_0)}{x - x_0}$ $= \lim_{\Delta x \to 0} \frac{\Delta f}{\Delta x} = \lim_{\Delta x \to 0} \frac{\Delta y}{\Delta x}$