KÄÄNTEISFUNKTION DERIVAATTA

$$(f^{-1})'(f(x)) \cdot f'(x) = 1 \quad \Big| : f'(x) \ (\neq 0)$$

$$(f^{-1})'(f(x)) = \frac{1}{f'(x)}$$

$$y_0 = f(x_0) \qquad (f^{-1})'(y_0) = \frac{1}{f'(x_0)}$$

Esim 1 $(f^{-1})'(5) = ?$, $f(x) = x^2 + 1$, $x \in [0, \infty[$

Ratkaisu

$y_0 = 5$

$x_0 = ?$

$y_0 = f(x_0)$

$5 = x_0^2 + 1$

$x_0^2 = 4 \quad | \sqrt{\ }$

$x_0 = \pm 2$ ei mj

$\neq$ mj

$(f^{-1})'(y_0) = \frac{1}{f'(x_0)}$

$f'(x) = 2x$

$(f^{-1})'(5) = \frac{1}{f'(2)} = \frac{1}{2 \cdot 2} = \frac{1}{4}$

Esim 2 $(f^{-1})'(-2) = ?$, $f(x) = x^3 + x$, $x \in \mathbb{R}$,
(f^{-1} on olemassa)

$y_0 = -2$

$-2 = x_0^3 + x_0$

$x_0 = -1$

$f'(x) = 3x^2 + 1$

$f'(-1) =$

$(f^{-1})'(y_0) = \frac{1}{f'(x_0)}$

$(f^{-1})'(-2) = \frac{1}{f'(-1)}$

$= \frac{1}{3 \cdot (-1)^2 + 1}$

$= \frac{1}{4}$