$$^{x:y}\text{ʅ} = \begin{cases} \dfrac{xy}{\sqrt{x^2+y^2}} & x{:}y \neq 0{:}0 \\ 0 & x{:}y = 0{:}0 \end{cases} \Longrightarrow \begin{cases} \text{stet} \\ \text{part diff} \\ \text{keine Richtungsabl} \\ \text{nicht total diff} \end{cases}$$

$$y = kx$$

$$^{x}\text{ʅ}_k = {}^{x:kx}\text{ʅ} = \frac{kx^2}{\sqrt{x^2+k^2x^2}} = \frac{k\overline{x}}{\sqrt{1+k^2}} = \begin{cases} \dfrac{kx}{\sqrt{1+k^2}} & x > 0 \\ \dfrac{-kx}{\sqrt{1+k^2}} & x < 0 \end{cases} \Longrightarrow \text{ keine Richtungsableitung for } k \neq 0{:}\infty$$

$$^{x:y}\text{ʅ} = e^y \underbrace{x^2 + 2xy}$$

$$\begin{bmatrix} _x\text{ʅ} & _y\text{ʅ} \end{bmatrix} = e^y \begin{bmatrix} 2x+2y & x^2+2xy+2x \end{bmatrix}$$

$$\begin{bmatrix} _x\text{ʅ} & _y\text{ʅ} \end{bmatrix} = \begin{bmatrix} 0 & 0 \end{bmatrix} \Leftrightarrow \begin{cases} y = -x \\ 0 = x^2+2xy+2x = x^2-2x^2+2x = 2x-x^2 \Longrightarrow x = 0{:}2 \end{cases} \Longrightarrow x{:}y = \begin{cases} 0{:}0 \\ 2{:}-2 \end{cases}$$

$$\frac{_{xx}\text{ʅ} \;\big|\; _{xy}\text{ʅ}}{_{xy}\text{ʅ} \;\big|\; _{yy}\text{ʅ}} = 2\,e^y \frac{1 \;\big|\; x+y+1}{x+y+1 \;\big|\; x^2/2+xy+2x} = 2 \begin{cases} \dfrac{1 \;|\; 1}{1 \;|\; 0} & x{:}y = 0{:}0 \text{ saddle} \\ e^{-2}\dfrac{1 \;|\; 1}{1 \;|\; 2} & x{:}y = 2{:}-2 \text{ min} \end{cases}$$

$$^{x:y}\text{ʅ} = xy\ln\left(x^2+y^2\right) \text{ extr}$$

$$ {}^{x:y}\text{ɿ} = x + y + \sqrt{1 - x^2 - y^2} \ \text{extr} $$

$$ n > 0 \Longrightarrow \int_{dx}^{a|\infty} \frac{\ln(x)}{x^{n+1}} = \frac{1}{na^n}\left(\ln(a) + \frac{1}{n}\right): \quad \int_{dx}^{1|\infty} \frac{\ln(x)}{x^{n+1}} = \frac{1}{n^2} \ \text{part int} $$

$$ n\int_{dx} \frac{\ln(x)}{x^{n+1}} = -\int_{dx} \ln(x)\,\frac{dx^{-n}}{dx} = -\frac{\ln(x)}{x^n} + \int_{dx} \frac{d\ln(x)}{dx}\,x^{-n} = -\frac{\ln(x)}{x^n} + \int_{dx} \frac{1}{x^{n+1}} = -\frac{\ln(x)}{x^n} - \frac{x^{-n}}{n} $$

$$ n\int_{dx}^{a|\infty} \frac{\ln(x)}{x^{n+1}} = -\frac{\ln(x)}{x^n} - \frac{x^{-n}}{n} = \frac{\ln(a)}{a^n} + \frac{a^{-n}}{n} $$

$$ \int_{dx}^{a|\infty} \frac{\ln(x)}{x} = \infty \ \text{subst} $$

$$ u = \ln(x) \Longrightarrow du = \frac{dx}{x} \Longrightarrow \int_{dx} \frac{\ln(x)}{x} = \int_{du} u = \frac{u^2}{2} = \frac{\ln^2(x)}{2} $$

$$ {}^{x}\text{ɿ} = \int_{dy}^{1|x^2} {}^{y}\cancel{x} \Longrightarrow \begin{cases} \text{ɿ} \ \text{diff} \\ {}^{x}\underset{-}{\text{ɿ}} \end{cases} $$

$$ \text{fund thm} \Longrightarrow \int_{dx}^{0|\pi/4} \frac{1}{1+x^2} $$

$$ y < R \Longrightarrow \int_{dx}^{0|y} \sum_{n}^{\mathbb{N}} a_n\,x^n = \sum_{n}^{\mathbb{N}} a_n\,\frac{y^{n+1}}{n+1} \ \text{unif conv} $$

$$ \begin{cases} \mathbb{R} \xrightarrow[n+1 \ \text{diff}]{\text{ɿ}} \mathbb{R} \\ {}_{n+1}\underset{-}{\text{ɿ}} = 0 \end{cases} \Longrightarrow \begin{cases} \text{ɿ} \ \text{poly} \\ \deg \text{ɿ} \leqslant n \end{cases} $$

$$\bigwedge_{x:y}^{\mathbb{R}} \overline{\,{}^{2x}\mathfrak{s} - {}^{2y}\mathfrak{s}\,} \leqslant 2\,\overline{x - y}$$

$$\bigwedge_{-1 \leqslant y \leqslant 1} \bigvee_{x}^{\mathbb{R}} : \quad y = {}^{x}\mathfrak{c}$$

$$\begin{cases} 0 \quad\quad |\mathbb{R} \\ \xrightarrow[\text{stet}]{\text{ʅ}_n} \\ \overline{{}^{x}\text{ʅ}} \leqslant 1/2^{n} \end{cases} \Longrightarrow \begin{cases} \sum_{n}^{\mathbb{N}} {}^{x}\text{ʅ}_n \ \text{glm conv} \\ 0 \quad\quad |\mathbb{R} \\ \xrightarrow[\text{stet}]{\sum_{n}^{\mathbb{N}} \text{ʅ}_n} \end{cases}$$