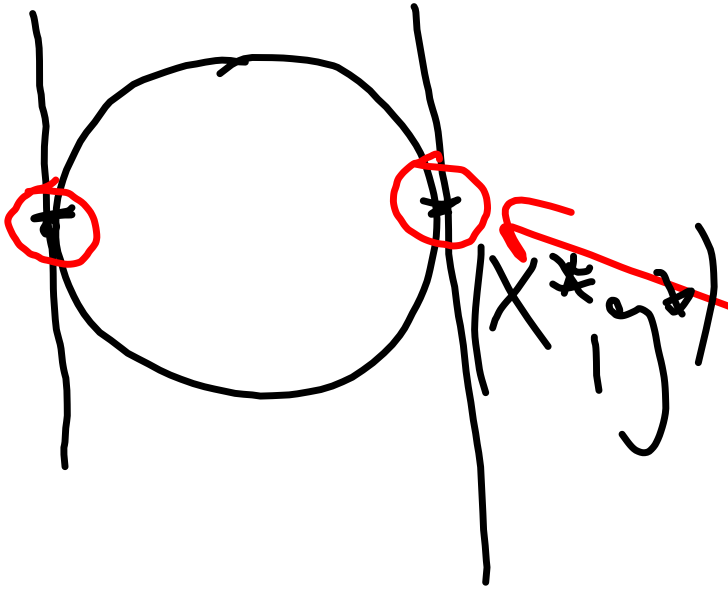


$$F_y(x^*, y^*) = 0$$

$$y = f'(x)\, dx$$

$$f'(x) = -\frac{F_x}{F_y}$$

$$f'(x^*, y^*) = 0$$

$$f'(x^*, y^*) = -\frac{[F_x, F_y]}{F_z} = \left[-\frac{F_x}{F_z}, -\frac{F_y}{F_z}\right]$$

$$f'_x = -\frac{F_x}{F_z} = -\frac{2x - z}{2z - x - \sqrt{2}y} = 0$$

$$f'_y = -\frac{2y - \sqrt{2}z}{2z - x - \sqrt{2}y} = 0$$

$$2x = z$$

$$2y = \sqrt{2}\, z$$

$$\underline{y = \sqrt{2}\, x}$$

$$1 = x^2 + 2x^2 + 4x^2 - 2x^2 - \sqrt{2}\sqrt{2}\, x \cdot 2x.$$

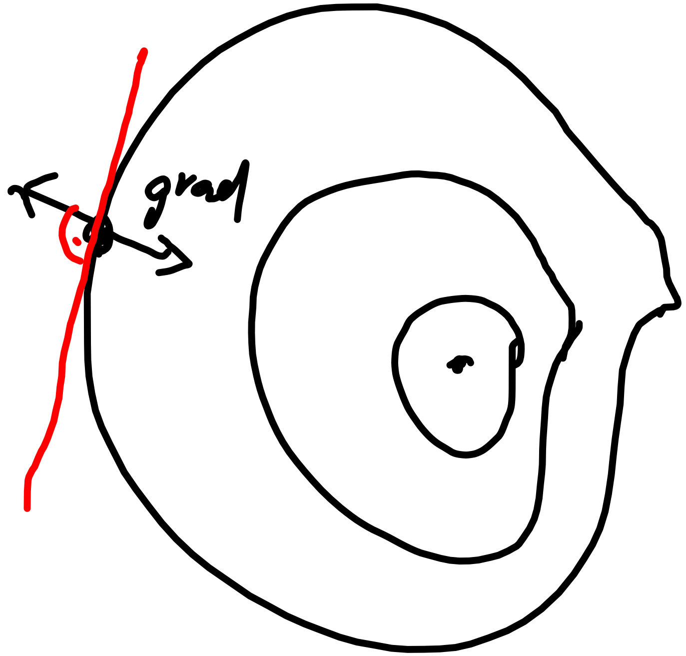
$$\underline{1 = x^2} \qquad x = \pm 1$$

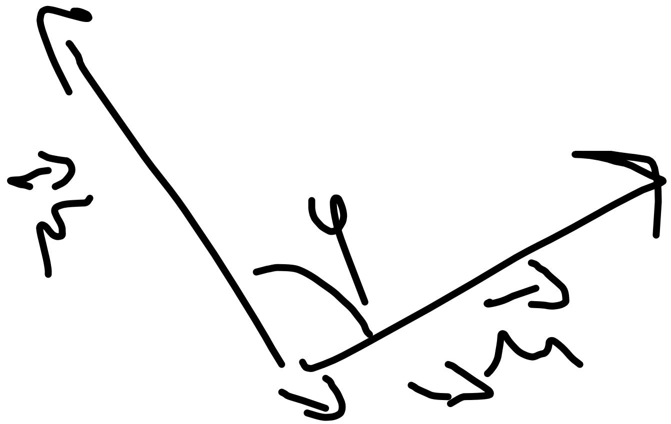
$$[1, \sqrt{2}, 2], \; [-1, -\sqrt{2}, -2]$$

$$\frac{1}{2z - x - \sqrt{2}y}\begin{pmatrix} -2 & 0 \\ 0 & -2 \end{pmatrix}$$

$$Hf(1, \sqrt{2}, 2) = \begin{pmatrix} -2 & 0 \\ 0 & -2 \end{pmatrix} \text{ neg. def.}$$

$$Hf(-1, -\sqrt{2}, -2) = \begin{pmatrix} 2 & 0 \\ 0 & 2 \end{pmatrix} \text{ poz. def.}$$





$$\cos\varphi = \frac{\vec{u}\cdot\vec{v}}{\|\vec{u}\|\cdot\|\vec{v}\|}$$

$d_v f$

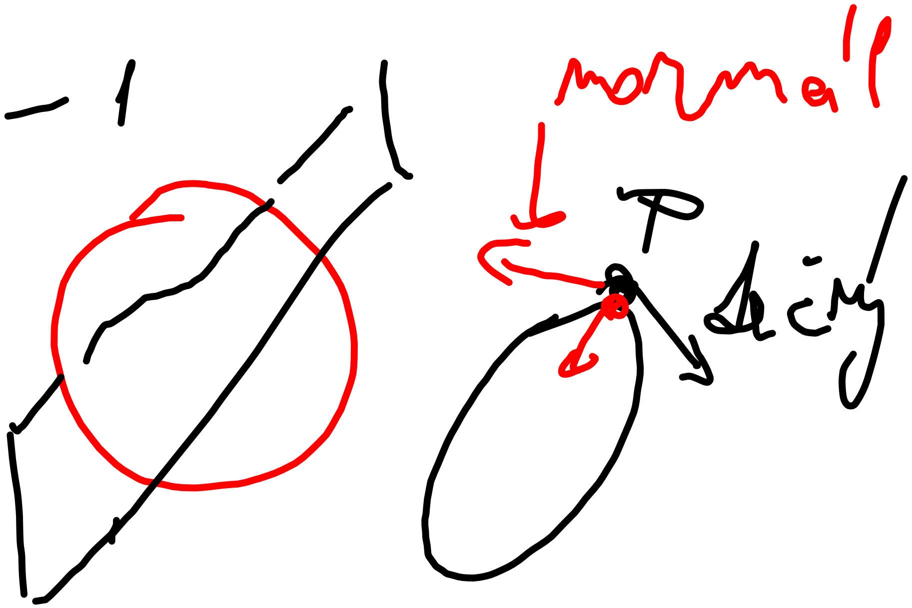
$\parallel$

$$d_v f = (df)(v) = (\mathrm{grad}\, f)\cdot v$$

$$\cos\varphi = \frac{\mathrm{grad}\, f\cdot\vec{v}}{\|\mathrm{grad}\, f\|\cdot\|\vec{v}\|} = \frac{d_v\cdot f}{\|\cdot\|\;\|\cdot\|}$$

$$0 = x^2 + y^2 + z - 1$$

$$0 = x + y + z$$



$[1,0,1]$

$$0 = \frac{\partial f}{\partial x}(x - x^*) + \frac{\partial f}{\partial y}(y - y^*) + \frac{\partial f}{\partial z}(z - z^*)$$

$$= \frac{2x}{2\sqrt{x^2+y^2}}\Bigg|_{\substack{x=1,\\ y=0}} (x - x^*) + \dots =$$

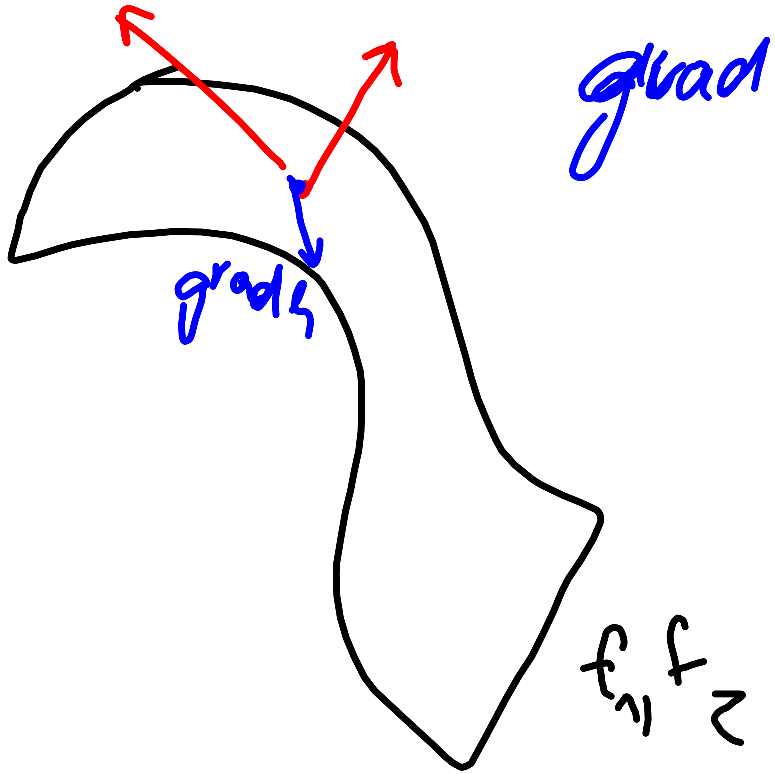
$$=$$

$$0 = d_{c'(0)} h(p) = dh(p)(c'(0)) =$$

$$= (\operatorname{grad} h)(p) \cdot \underbrace{c'(0)}_{v}$$

$$D^1 F = \underbrace{\begin{pmatrix} df_1 \\ \vdots \\ df_n \end{pmatrix}}_{m+n} \left.\vphantom{\begin{pmatrix} df_1 \\ \vdots \\ df_n \end{pmatrix}}\right\} n$$

$\text{grad}\, L \in \mathcal{L}(\text{grad}\, f_1, \text{grad}\, f_2)$



$$f(x,y) = 2x + y$$

$$\underbrace{\frac{x^2}{4} + y^2}_{\text{vazební podmínka}} = 1$$

$$g(x,y) = \frac{x^2}{4} + y^2 - 1 = $$

$$\frac{\partial f}{\partial x} = 2$$

$$\frac{\partial f}{\partial y} = 1$$

$$L(x,y,\lambda) = \underbrace{2x+y}_{f(x,y)} - \lambda\left(g(x,y)\right)$$

extrémy $f(x,y) = x^2 \cdot y$

na $5x^2 + 2y^2 = 14$

Lagr. fce:

$L(x,y,\lambda) = x^2 \cdot y - \lambda(5x^2 + 2y^2 - 14)$

$$\boxed{\begin{aligned} L_x &= 2x \cdot y - 10\lambda x = 0 \\ L_y &= x^2 - 4\lambda y = 0 \\ 5x^2 &+ 2y^2 = 14 \end{aligned}}$$

$x(2y - 10\lambda) = 0$

(1) $x = 0$

$2y^2 = 14 \Rightarrow y = \pm\sqrt{7}$

$\lambda = 0$

(2) $\lambda = \frac{y}{5}$

$x^2 - 4y^2 = 0$

$5x^2 + 2(y^2) = 14$

$5 \cdot \frac{4}{5} y^2 + 2y^2 = 14$

$6y^2 = 14$

$y^2 = \frac{7}{3}$

$y = \pm\sqrt{\frac{7}{3}}$

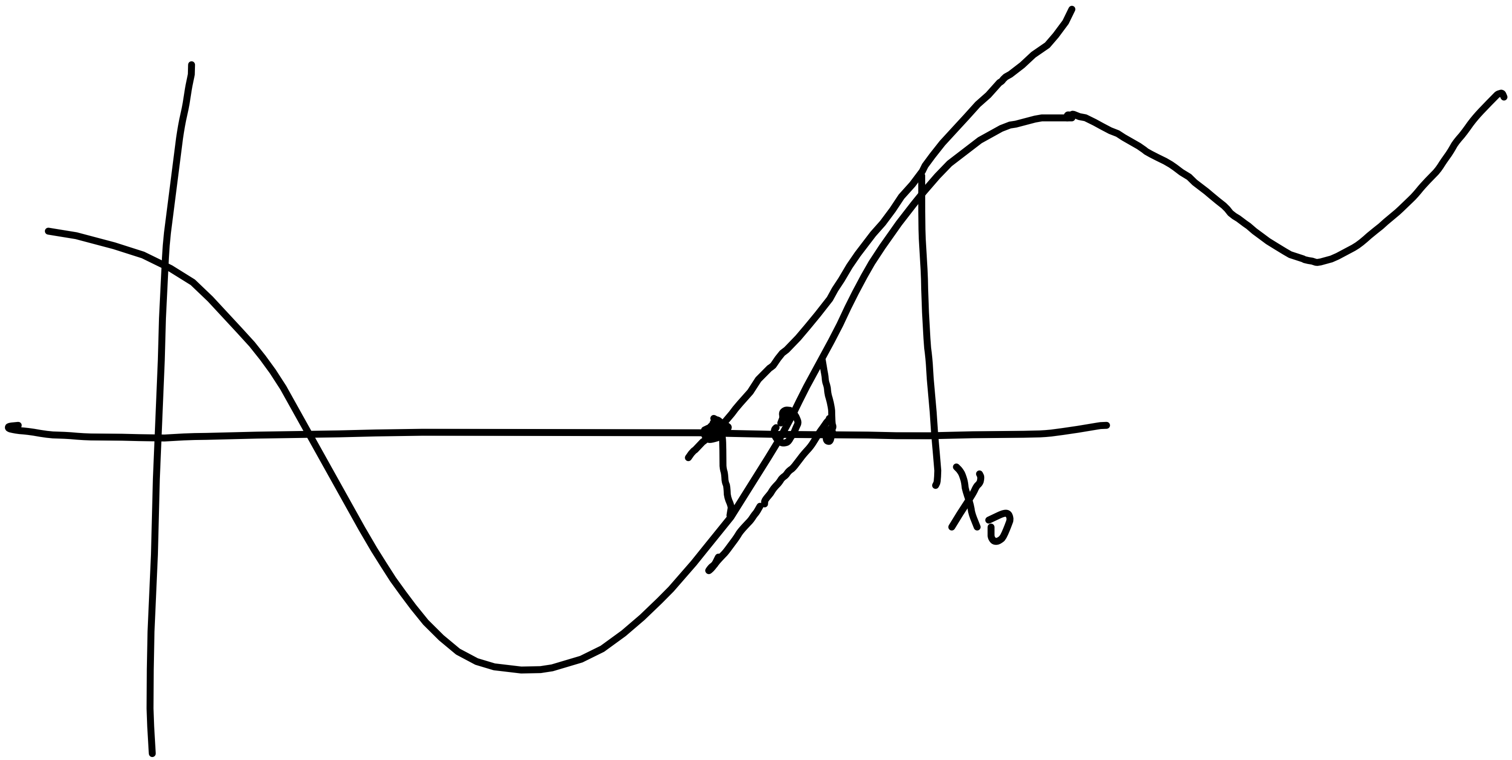
$f(x,y) = x^2 y$

max. $\frac{28}{15}, \sqrt{\frac{7}{3}}$

min. (-1). $-u-$

$x^2 = \frac{4}{5} y^2 \to \frac{28}{15}$

$x = 2 \cdot \pm\sqrt{\frac{7}{15}}$



$$y - y_0 = f'(x_0) \cdot (x - x_0)$$

$$\cancel{0} - y_0 = f'(x_0) \cdot (x - x_0)$$

$$x = \frac{f'(x_0) \cdot x_0 - y_0}{f'(x_0)} = x_0 - \frac{f(x_0)}{f'(x_0)}$$

$\sqrt{2}$ kořen $x^2 - 2$

$$x_{n+1} = x_n - \frac{x_n^2 - 2}{2x_n} =$$

$$= x_n - \frac{x_n}{2} + \frac{1}{x_n} =$$

$$= \frac{x_n}{2} + \frac{1}{x_n}$$

$x_0 = 1$; $x_1 = \frac{3}{2}$; $x_2 = \frac{3}{4} + \frac{2}{3} = \frac{17}{12}$, ...

$$x_{n+1} = x_n - \frac{x_n^{\frac{1}{3}}}{\frac{1}{3}x_n^{-\frac{2}{3}}} = x_n - 3\cdot x_n =$$

$$= -2x_n$$

$$f'(x) = 0$$

$$x_{n+1} = x_n - \frac{f'(x_n)}{f''(x_n)}$$

grad

Hf