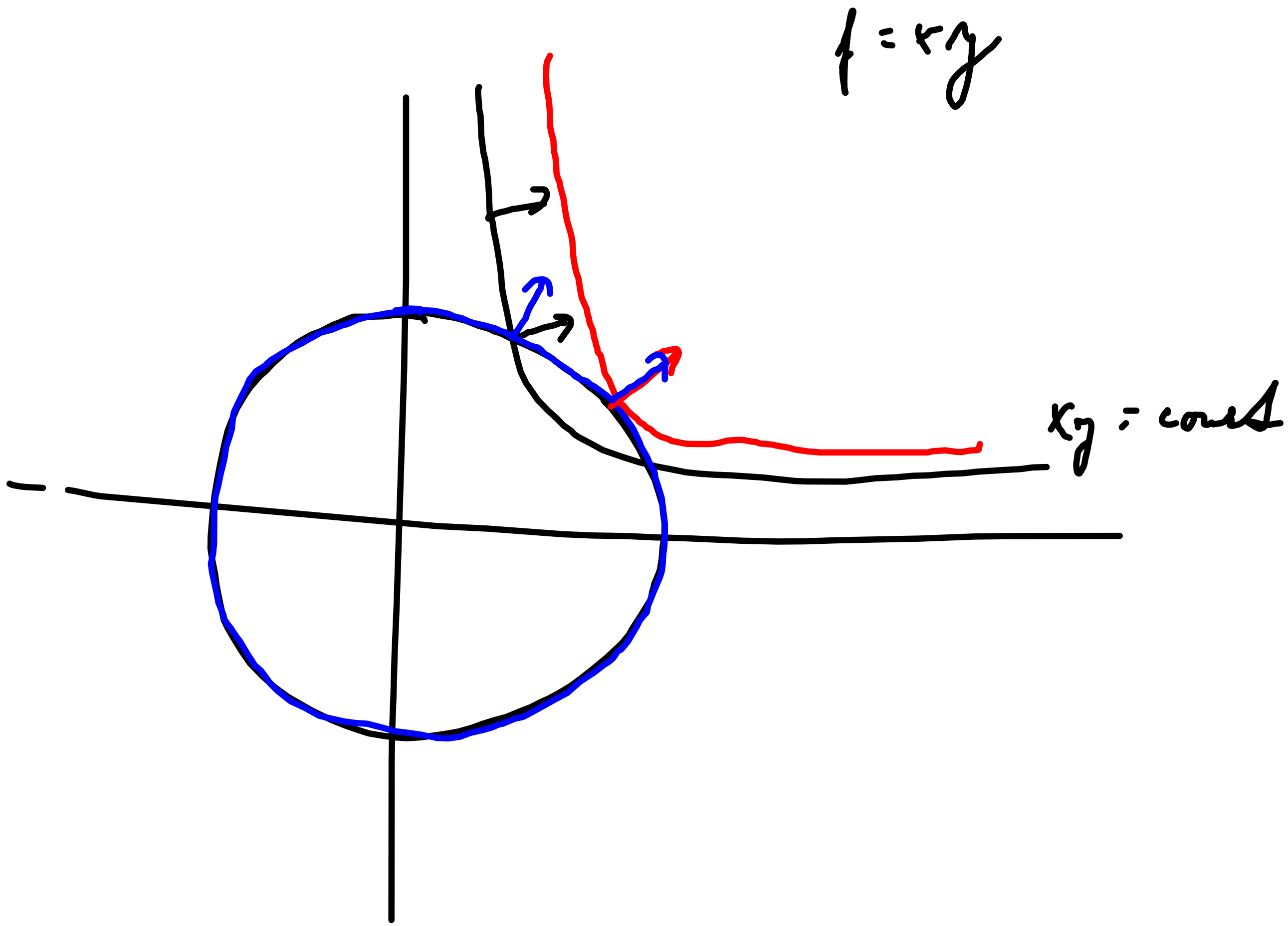
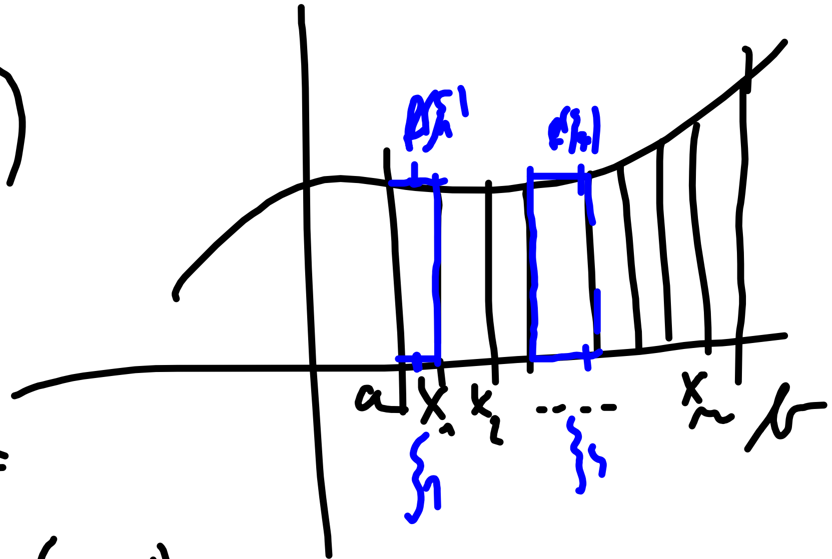

$f = xy$
$xy = const$

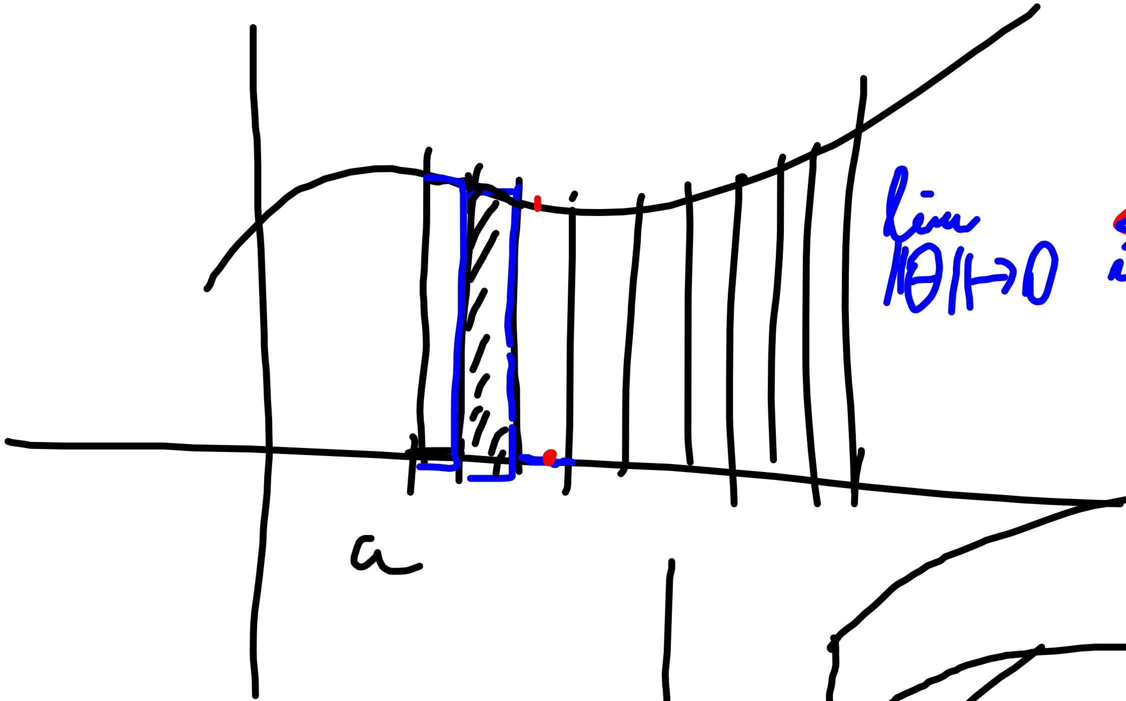
$$\frac{\partial}{\partial y}\int_a^b f(x,y)\,dx = \int_a^b \frac{\partial}{\partial y} f(x,y)\,dx$$

$$\int_{\Theta,\xi} \sum_i f(\xi_i)(x_{i+1}-x_i)$$



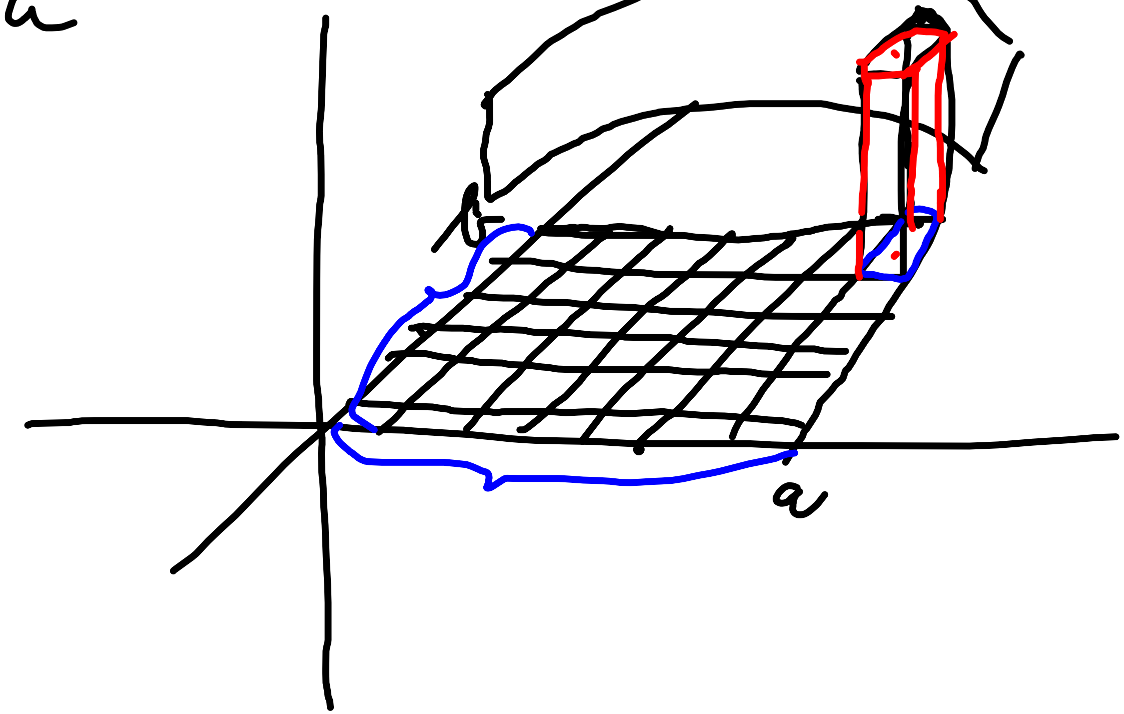
$$\left| f(x, y+h) - f(x,y) \right| =$$

$$= h \cdot \frac{\partial f}{\partial y}(x, \xi_i)$$



$$\lim_{\|\Theta\|\to 0} \sum_{i=1}^{n} f(\xi_i)\underbrace{(x_{i+1}-x_i)}$$

$$\xi_i \in (x_i, x_{i+1})$$

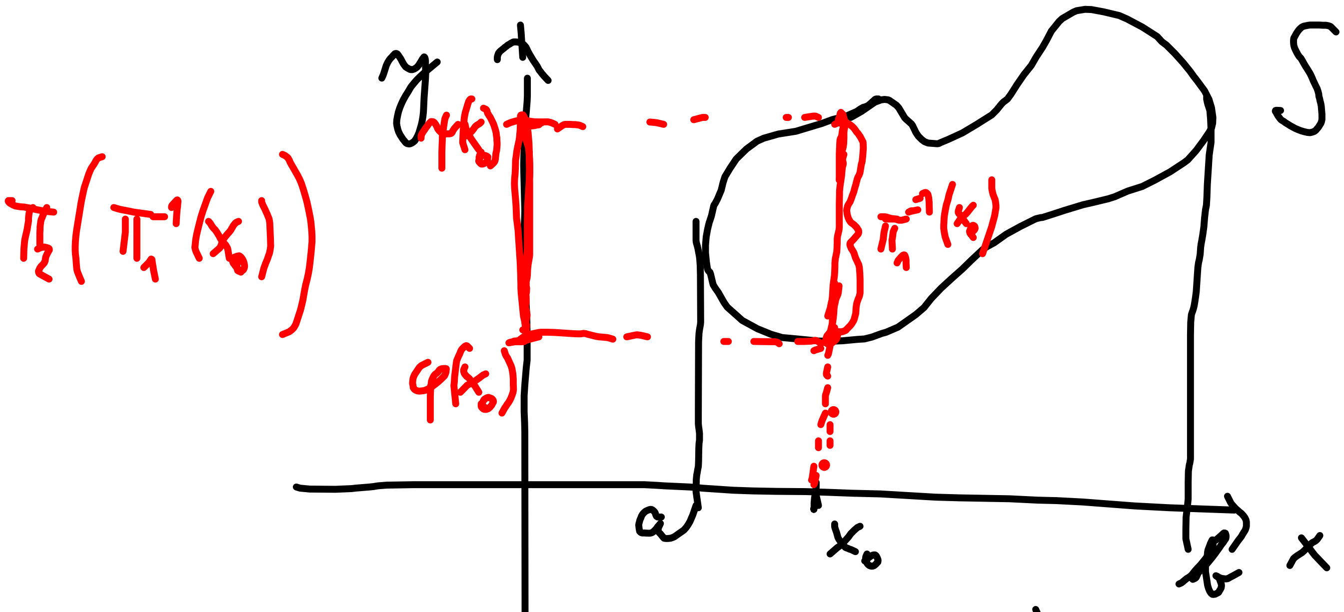


$$\underbrace{(f+g)(\xi_i)(x_{i+1}-x_i)\cdots(\eta_{j+1}-\eta_j)}_{\in \mathbb{R}} =$$

$$= \underbrace{f(\xi_i)(x_{i+1}-x_i)\cdots(\eta_{j+1}-\eta_j)}+$$

$$+ \underbrace{g(\xi_i)(x_{i+1}-x_i)\cdots(\eta_{j+1}-\eta_j)}$$

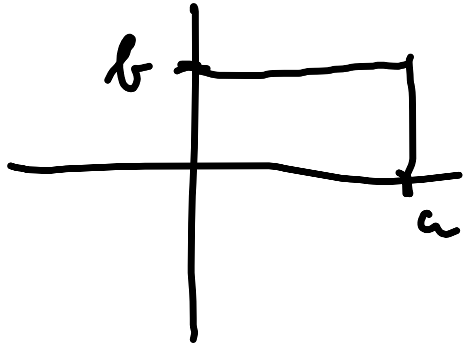
$$S = \{ (x_1, \dots, x_n) \in \mathbb{R} \mid x_1 \in \langle a, b \rangle,\ x_2 \in \langle \varphi(x_1), \psi(x_1) \rangle, \dots$$
$$\dots x_n \in \langle \varphi(x_1, \dots, x_{n-1}), \psi(x_1, \dots, x_{n-1}) \rangle \}$$



$\pi_1(S) = \langle a, b \rangle$

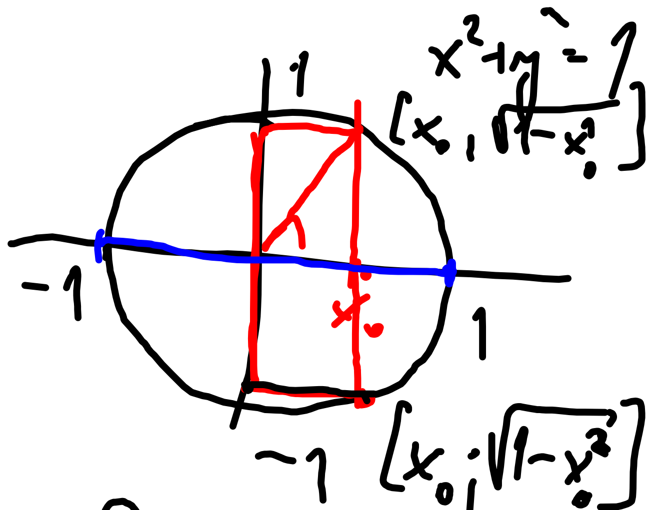
Obsah obdélníka o stranách a, b:

$$\int_0^b \int_0^a 1 \cdot dx\,dy = a \cdot b$$



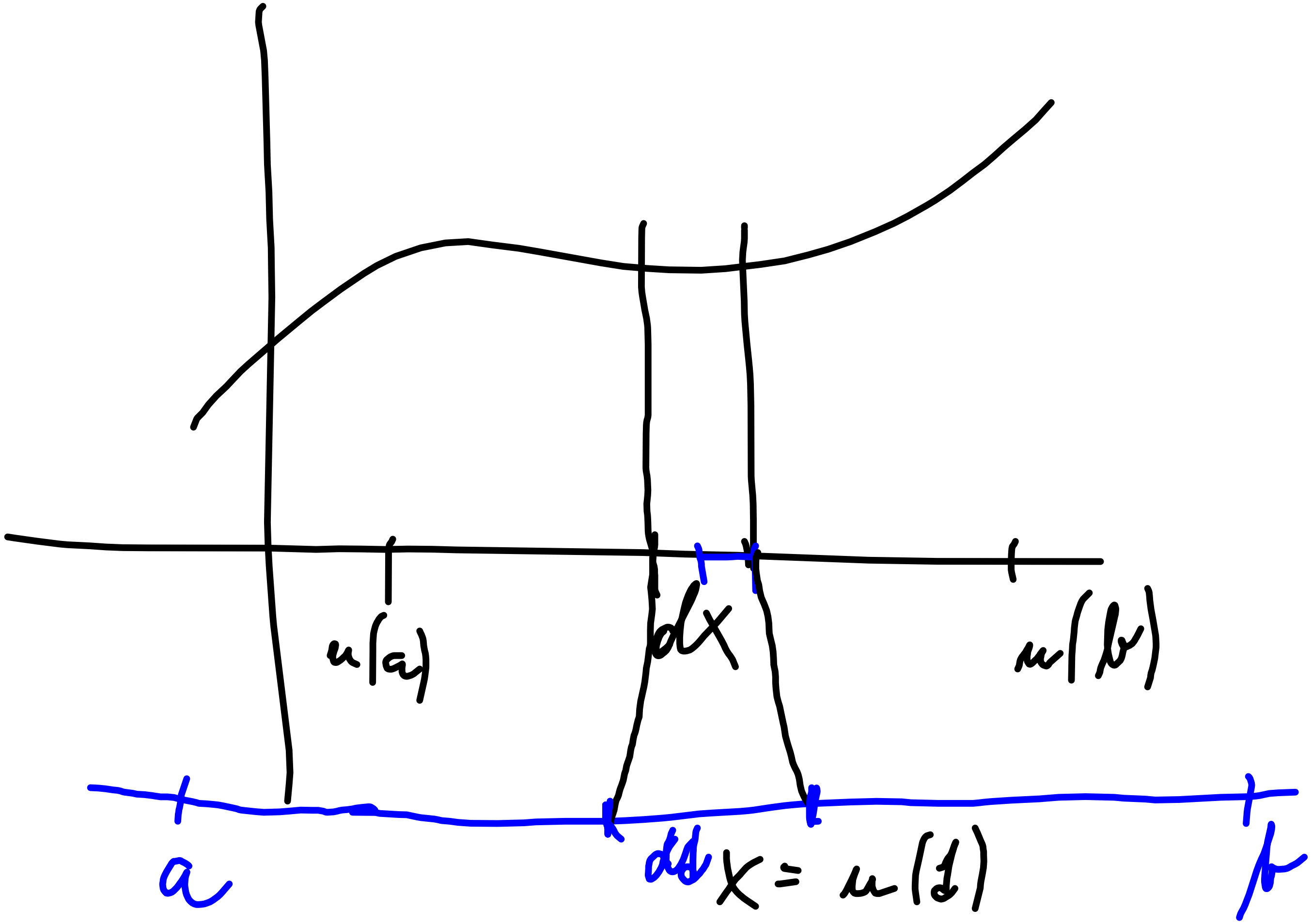
Obsah kruhu o poloměru 1

$$\int_{-1}^{1} \int_{-\sqrt{1-x^2}}^{\sqrt{1-x^2}} dy\,dx = \int_{-1}^{1} 2\sqrt{1-x^2} = \dots$$



$$S = (0, 2\pi) \times (0, 1)$$

$$= \int_0^{2\pi} \int_0^1 r\,dr\,d\varphi = \int_0^{2\pi} \frac{1}{2}\,d\varphi = \pi$$

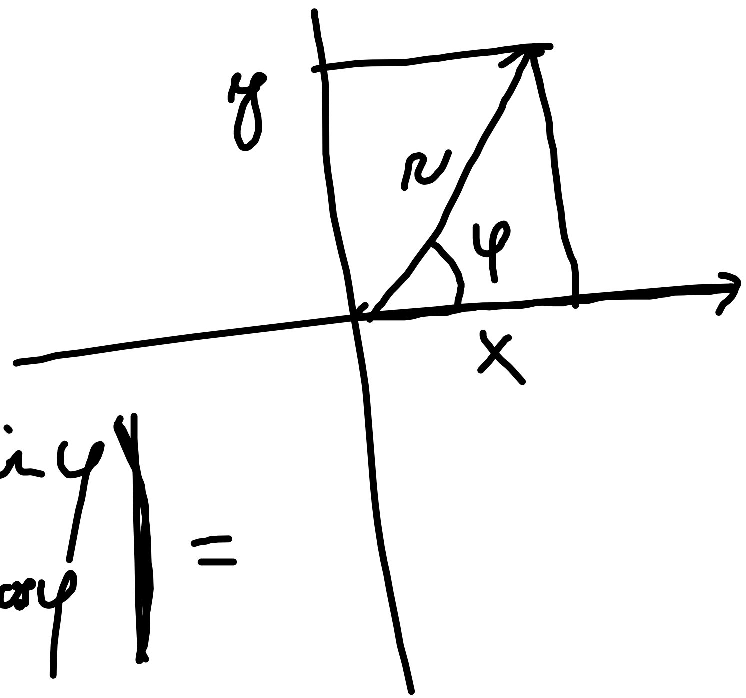


$$x \in \langle u(a), u(b) \rangle \Leftrightarrow t \in (a, b)$$

$$dx = \boxed{\frac{du}{dt}}\, dt$$

Zrovna příklad s kružnicí:

Uvažme polární souřadnice, tj. zobrazení



$$G : \underset{r}{\mathbb{R}} \times (0, \underset{\varphi}{2\pi}) \to \mathbb{R}^2$$

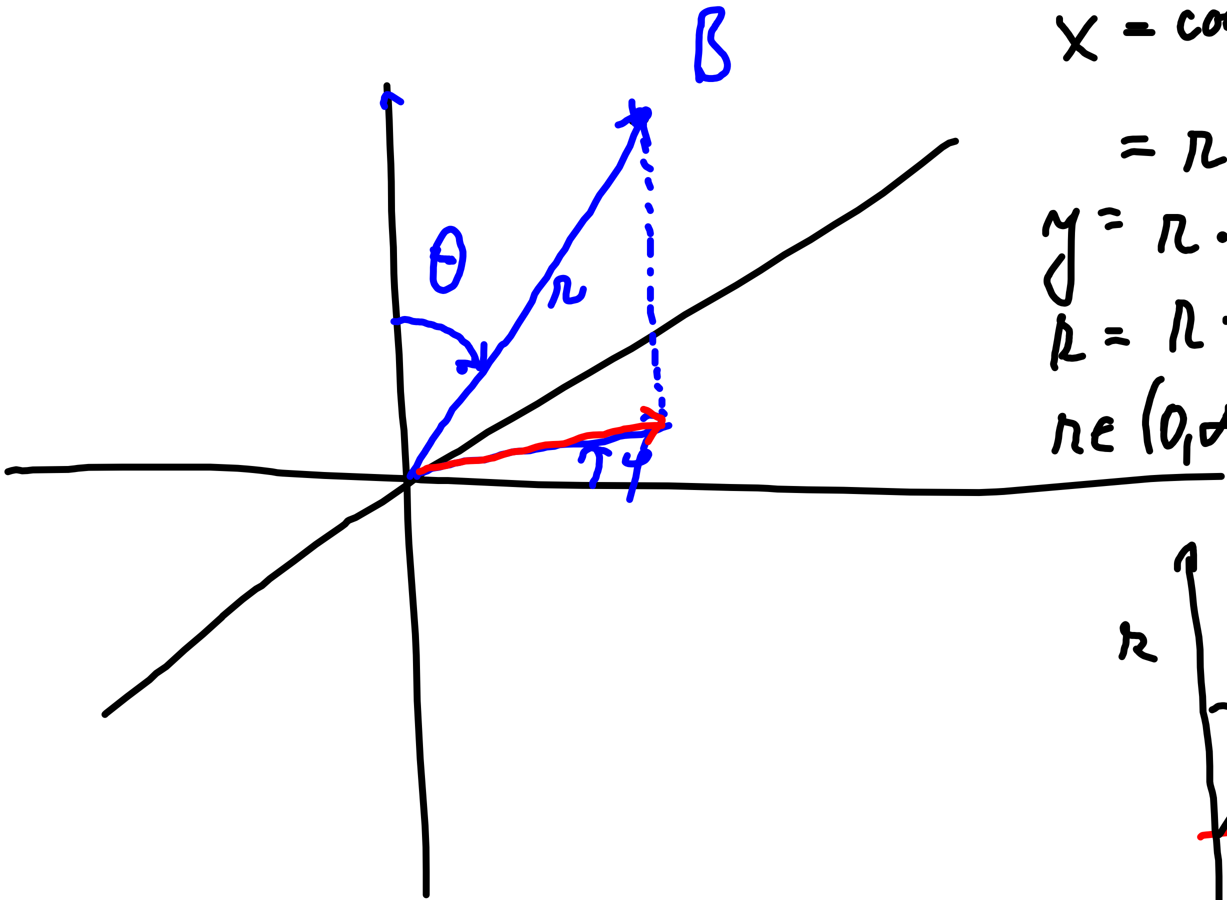
$$x = r\cos\varphi$$

$$y = r\sin\varphi$$

$$J'G = \begin{vmatrix} \cos\varphi & -r\sin\varphi \\ \sin\varphi & r\cos\varphi \end{vmatrix} =$$

$$|J'G| = r\cos^2\varphi + r\sin^2\varphi = r$$

Sférické souřadnice v $\mathbb{R}^3$



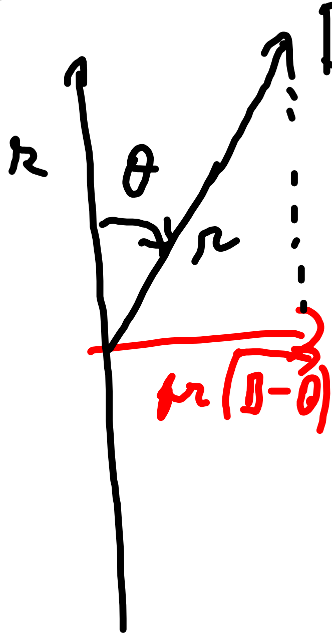
$$x = \cos\varphi \cdot \| pr_{xy} (\overrightarrow{B-O}) \| =$$

$$= r \cdot \cos\varphi \cdot \sin\theta$$

$$y = r \cdot \sin\varphi \sin\theta$$

$$z = r \cdot \cos\theta$$

$$r \in (0, \infty),\ \varphi \in \langle 0, 2\pi),\ \theta \in \langle 0, \pi \rangle$$



$\Delta^r G =$