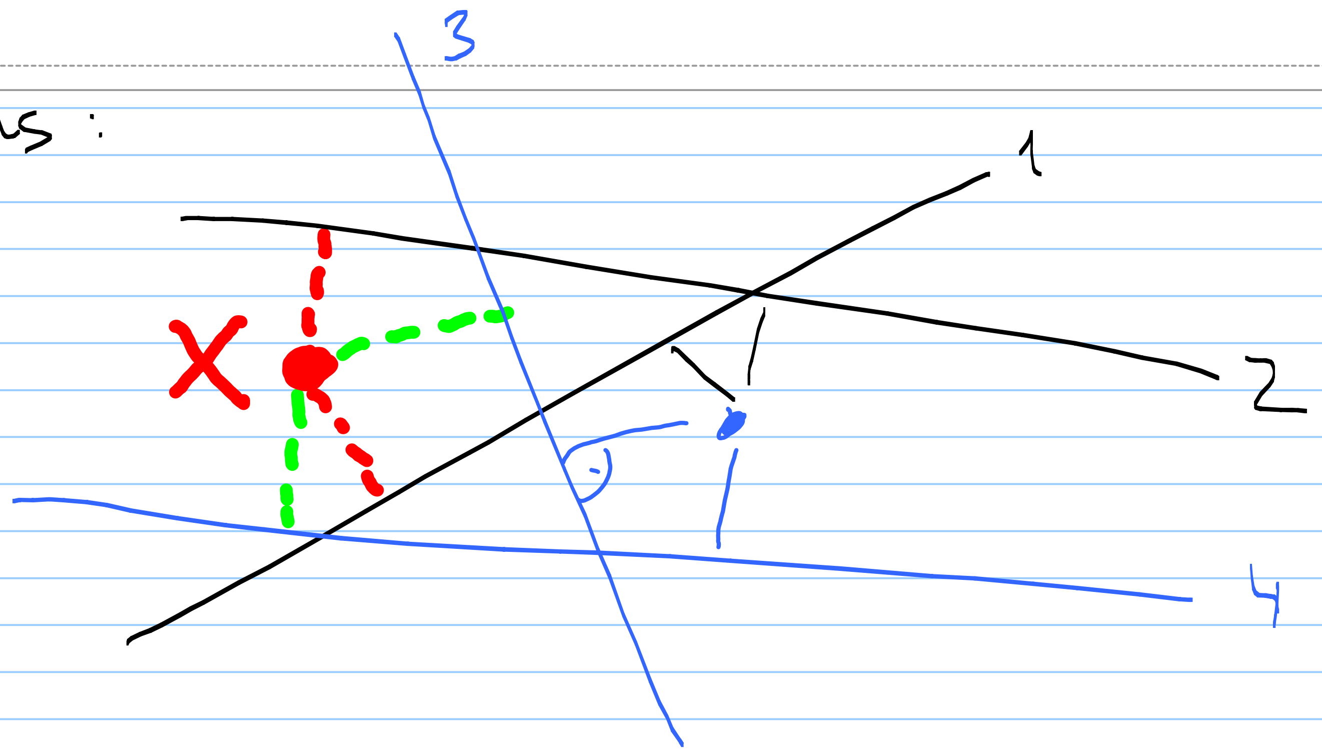
Note Title 07.10.2021

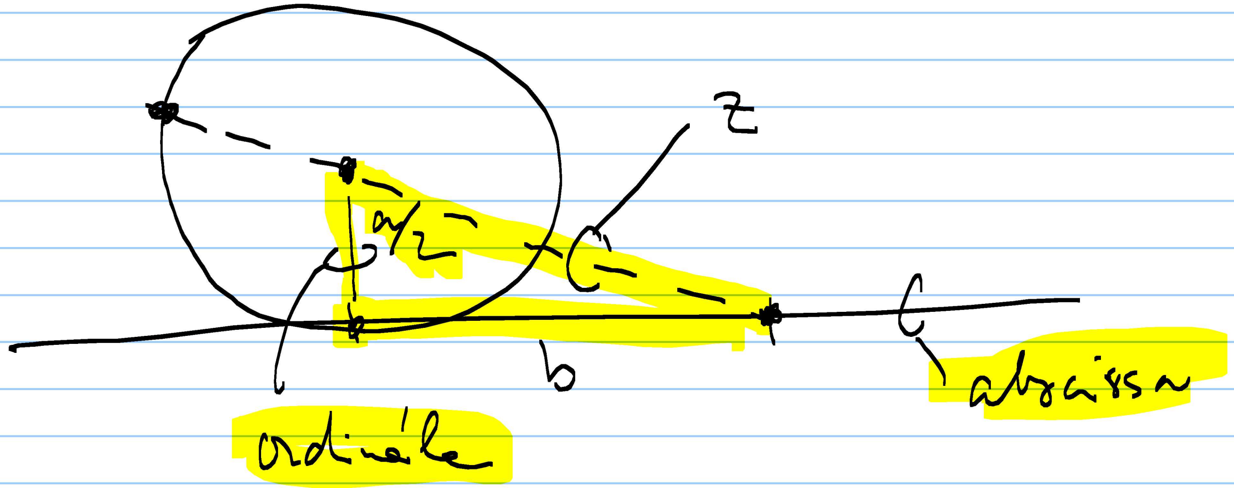
Pappus:



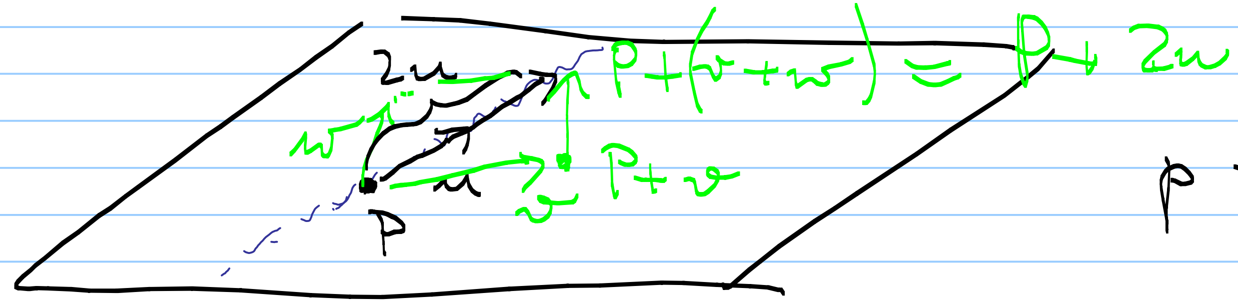
poloha X obecně opíše nějakou kuželosečku

<u>Descartes</u> $z^2 = az + b^2$

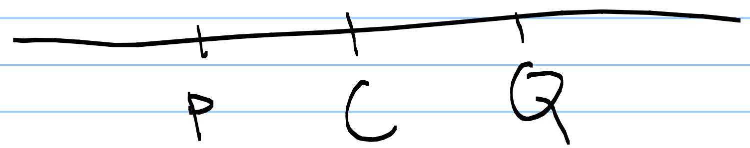
$$\left(z - \frac{1}{2}a\right)^2 - \frac{1}{4}a^2 = b^2$$



Analytická geometrie dnes: VEKTORY



$$p = P + tu$$



$$\frac{|PC|}{|QP|}$$ poměr velikostí

$$2u = v + w$$

lineární kombinace vektorů:

$\mathbb{R}^2$ = vektory

$a, b \in \mathbb{R}$ = skaláry

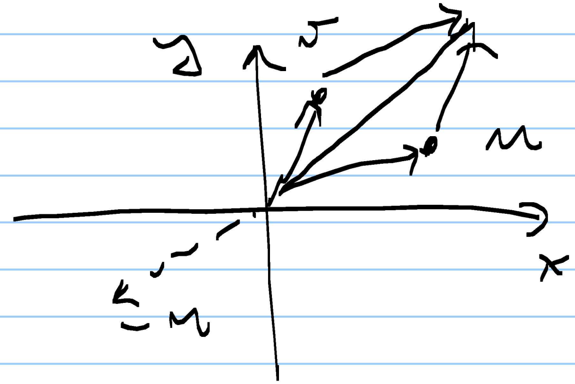
u, v, a, b

$u \in \mathbb{R}^2$, $v \in \mathbb{R}^2$

$u = (u_1, u_2)$

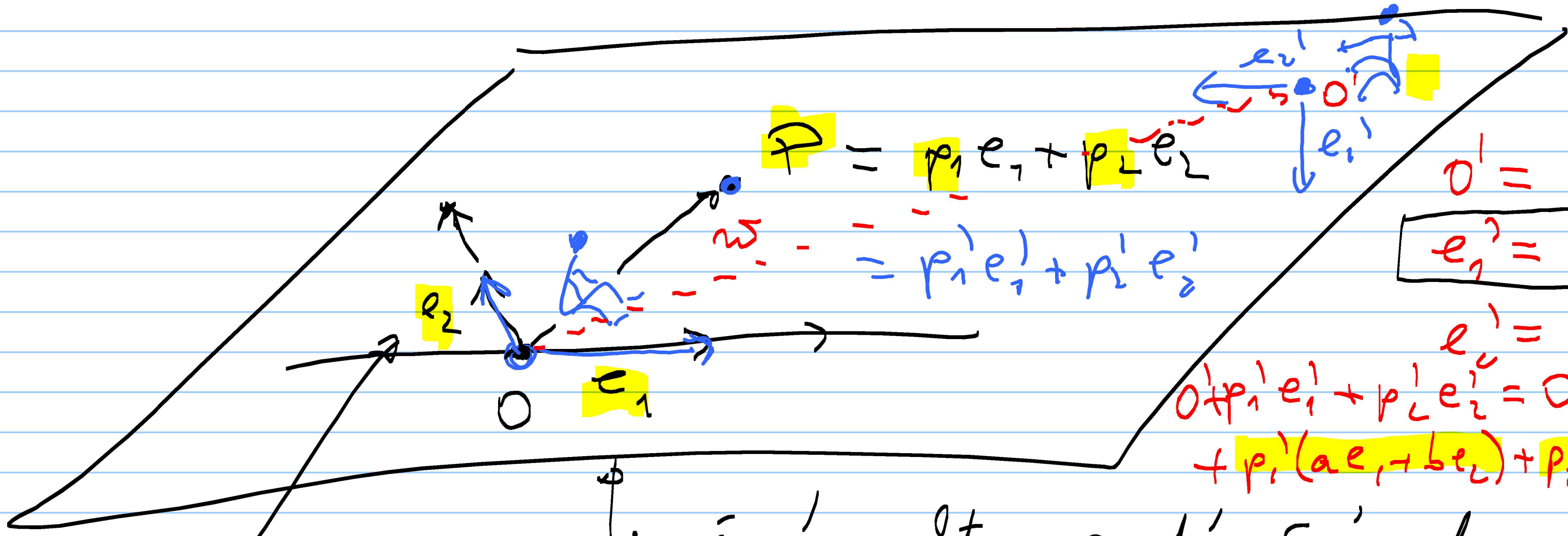
$v = (v_1, v_2)$

$u + v = (u_1 + v_1, u_2 + v_2)$



$au + bv = (au_1 + bv_1, au_2 + bv_2)$

Souřadnice:



$P = p_1 e_1 + p_2 e_2$

$\quad = \cdots = p_1' e_1' + p_2' e_2'$

$O' = O + w$

$\boxed{e_1' = a e_1 + b e_2}$

$e_2' = c e_1 + d e_2$

$O + p_1' e_1' + p_2' e_2' = O + w + p_1'(a e_1 + b e_2) + p_2'(c e_1 + d e_2)$

ordinála (s měřítkem)

směrný vektor zadávající abscisu (vnitřní měřítko)

$w = w_1 e_1 + w_2 e_2$

$P = O + w + (p_1' a + p_2' c) e_1 + (p_1' b + p_2' d) e_2$

$$u = \begin{pmatrix} u_1 \\ u_2 \end{pmatrix}$$

$$\begin{pmatrix} a & c \\ b & d \end{pmatrix} \cdot \begin{pmatrix} p_1 \\ p_2 \end{pmatrix} = \begin{pmatrix} ap_1 + cp_2 \\ bp_1 + dp_2 \end{pmatrix}$$

$$\varphi$$

$$e_1' = ae_1 + be_2$$

$$A \cdot B \neq B \cdot A$$

$$A \cdot (B \cdot C) = (A \cdot B) \cdot C$$

$$A \cdot (B + C) = A \cdot B + A \cdot C$$

$$A + B = B + A$$

$$A \cdot E = A$$

$$E = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$$

$$P = \begin{pmatrix} w_1 \\ w_2 \end{pmatrix} + \begin{pmatrix} a & c \\ b & d \end{pmatrix} \cdot \begin{pmatrix} p_1' \\ p_2' \end{pmatrix} = \begin{pmatrix} p_1 \\ p_2 \end{pmatrix}$$

$$a_1 x_1 + a_2 x_2 = b_1$$

$$a_3 x_1 + a_4 x_2 = b_2$$

$$\begin{pmatrix} a_1 & a_2 \\ a_3 & a_4 \end{pmatrix} \cdot \begin{pmatrix} x_1 \\ x_2 \end{pmatrix} = \begin{matrix} b_1 \\ b_2 \end{matrix}$$

$B \cdot A = E$

$A \cdot \begin{pmatrix} x_1 \\ x_2 \end{pmatrix} = \begin{pmatrix} b_1 \\ b_2 \end{pmatrix}$

$\underbrace{B \cdot A}_{=E} \cdot \begin{pmatrix} x_1 \\ x_2 \end{pmatrix} = B \begin{pmatrix} b_1 \\ b_2 \end{pmatrix}$

$a \cdot b = c \quad a \neq 0$

$b = \frac{c}{a}$

A^{-1} existuje $\iff$ pro $A = \begin{pmatrix} a & b \\ c & d \end{pmatrix}$ $\det A = ad - bc \neq 0$

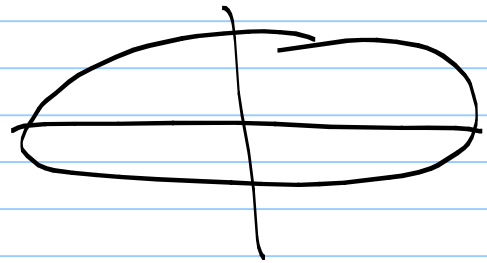
$\underbrace{\begin{matrix} ax + by = s \\ cx + dy = t \end{matrix}}$

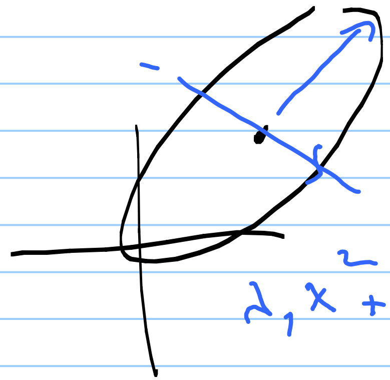
$$u = \begin{pmatrix} u_1 \\ u_2 \end{pmatrix} \qquad \|u\|^2 = u_1^2 + u_2^2$$

$$\|u\|^2 = u^T \cdot u$$

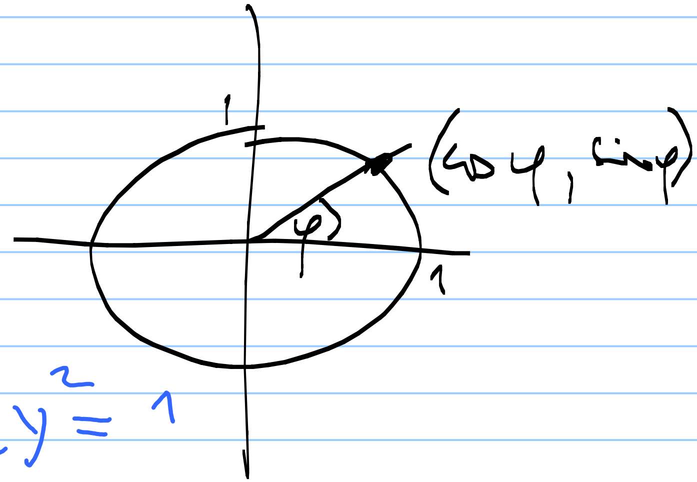
$$\left\| \begin{pmatrix} \boxed{\begin{matrix} a \\ c \end{matrix}} & \boxed{\begin{matrix} b \\ d \end{matrix}} \end{pmatrix} \cdot \begin{pmatrix} u_1 \\ u_2 \end{pmatrix} \right\| = \left\| \begin{matrix} u_1 \\ u_2 \end{matrix} \right\|$$

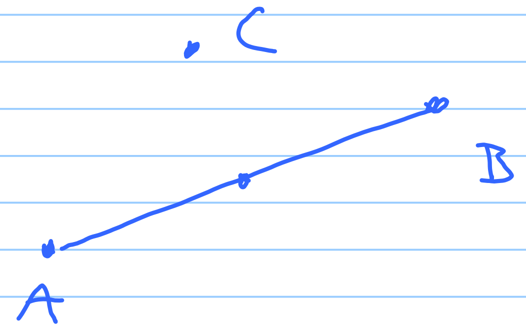
kolmé a jednotkové



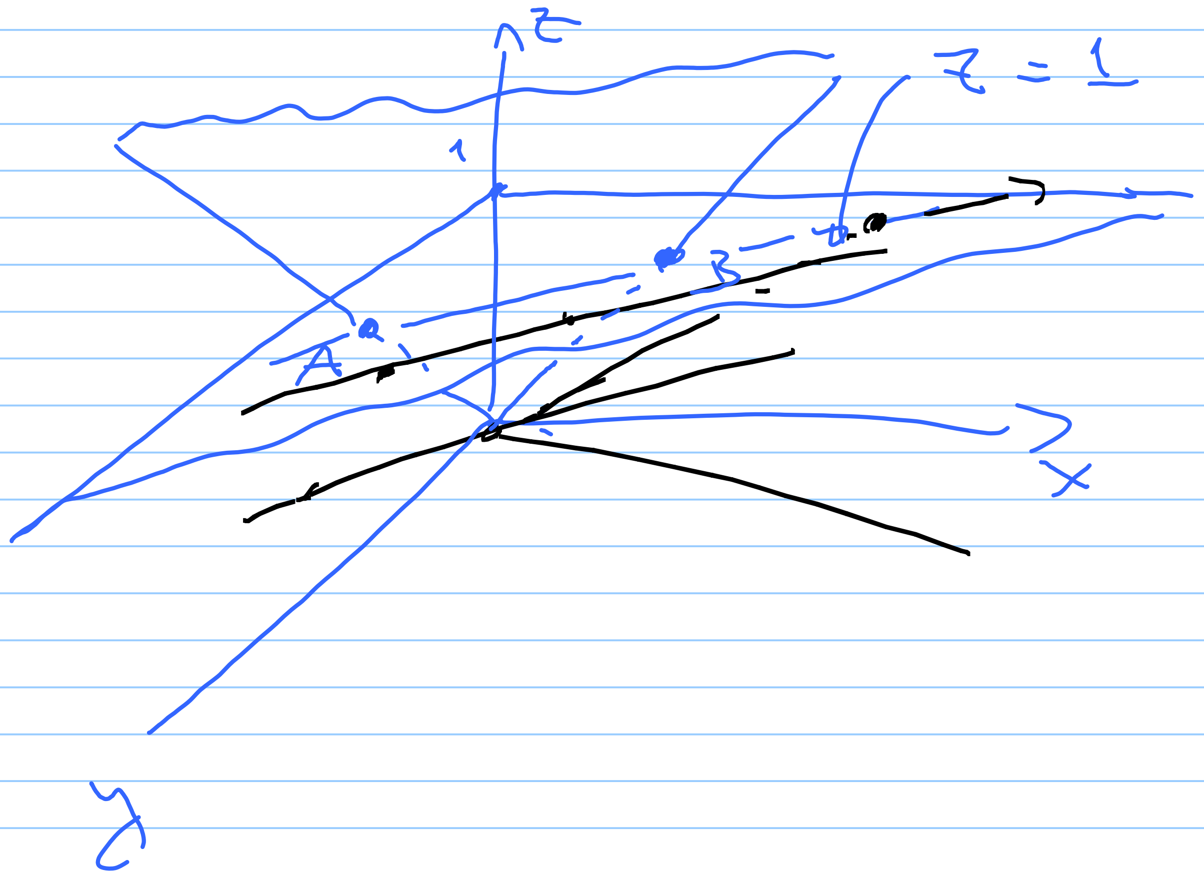


$$\lambda_1 x^2 + \lambda_2 y^2 = 1$$





$$|AC| + |CB| = |AB|$$



$(x : y : z)$