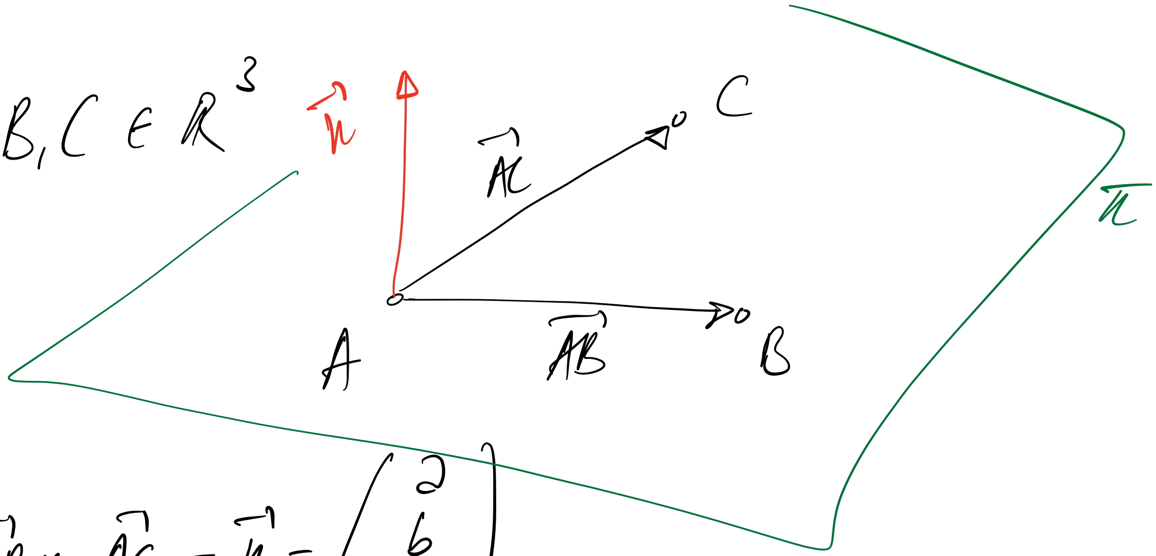
$A, B, C \in \mathbb{R}^3$



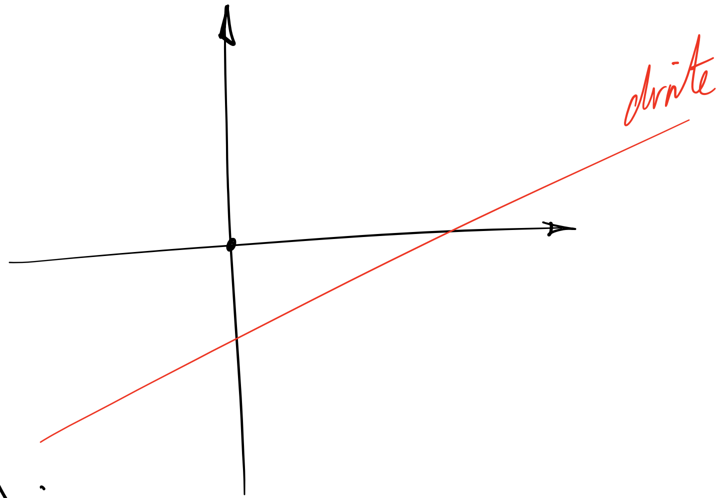
$$\vec{AB} \times \vec{AC} = \vec{n} = \begin{pmatrix} a \\ b \\ c \end{pmatrix}$$

$$\pi: ax + by + cz + d = 0$$

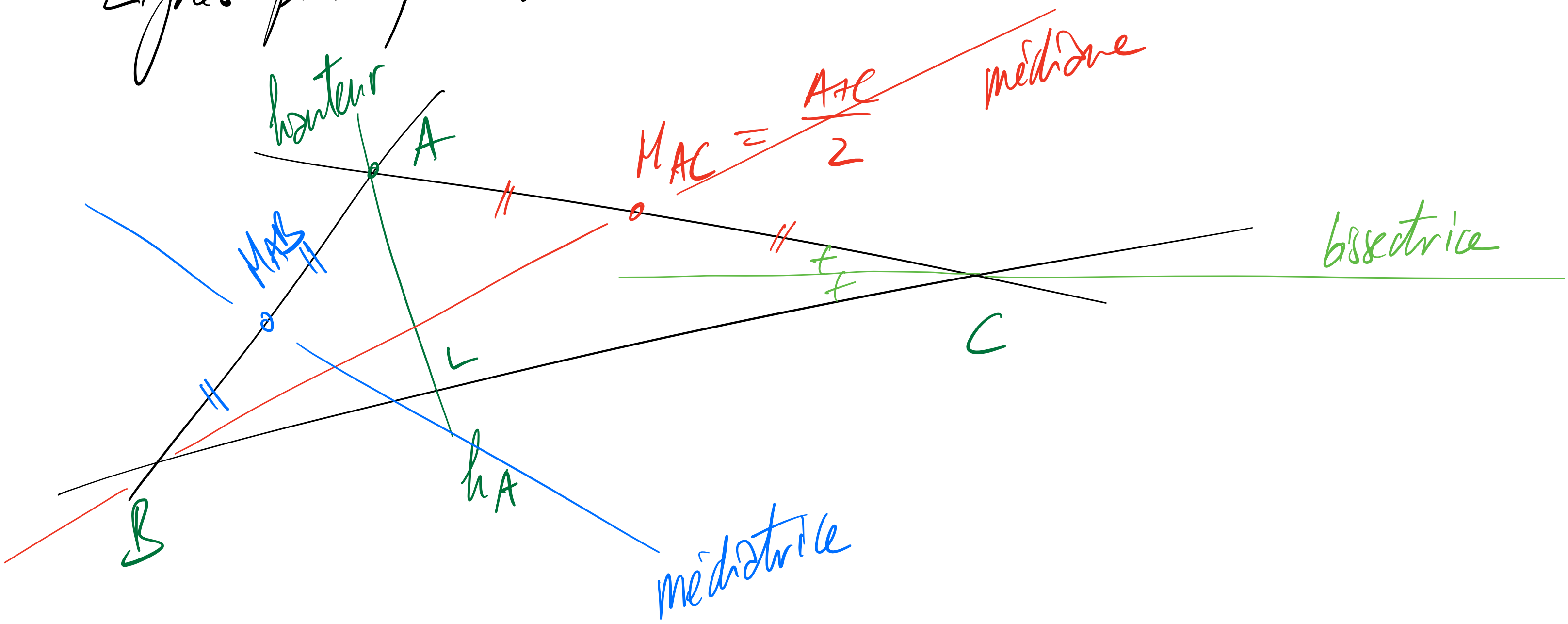
?

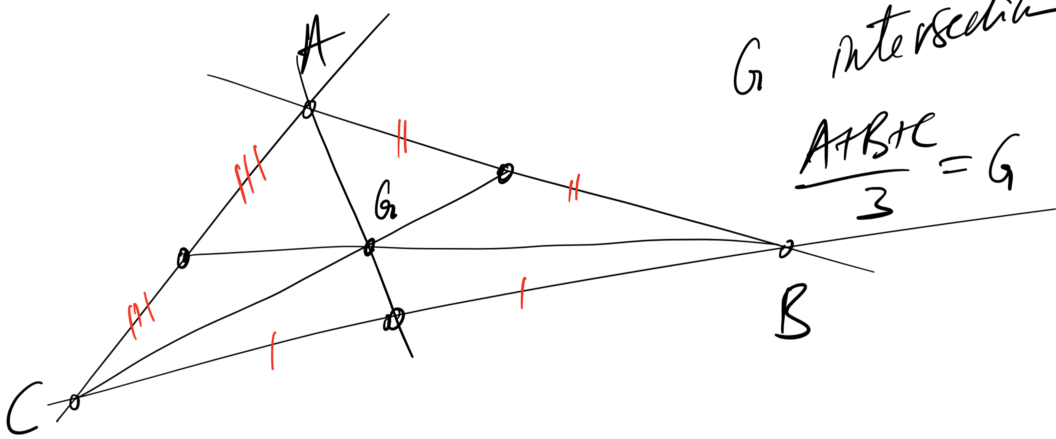
Géométrie plane

$$\boxed{ax+by+c=0}$$



Lignes principales du △ :





G intersection des médianes

$$\frac{A+B+C}{3} = G$$

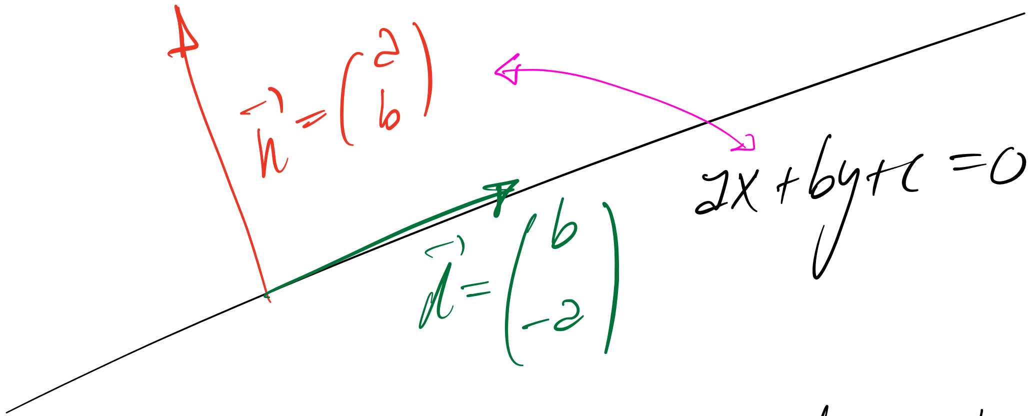
$d_1 : ax+by+c=0$

$d_2 : bx-ay+k=0$

$d_1 \perp d_2$

$\vec{n}_1 = \begin{pmatrix} a \\ b \end{pmatrix}$ $\quad \vec{d}_1 = \begin{pmatrix} -b \\ a \end{pmatrix}$

$\vec{n}_2 = \begin{pmatrix} b \\ -a \end{pmatrix}$ $\quad \vec{d}_2 = \begin{pmatrix} a \\ b \end{pmatrix}$

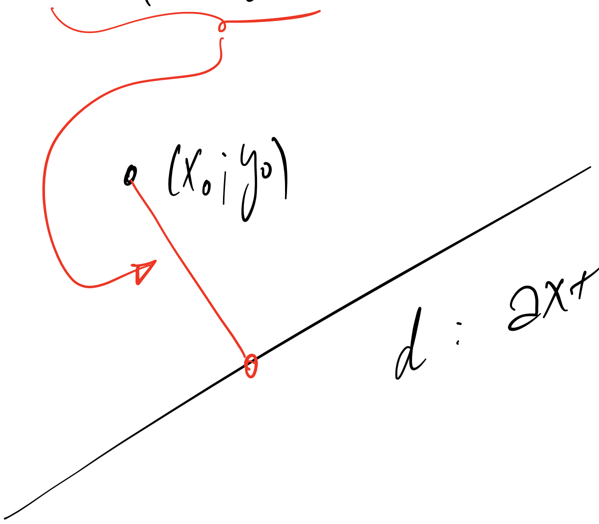


$\vec{n} = \begin{pmatrix} a \\ b \end{pmatrix}$

$\vec{d} = \begin{pmatrix} b \\ -a \end{pmatrix}$

$ax + by + c = 0$

$$\operatorname{dist}\big((x_0; y_0); d\big) = \frac{|ax_0 + by_0 + c|}{\sqrt{a^2 + b^2}}$$



$(x_0; y_0)$

$d: ax + by + c = 0$

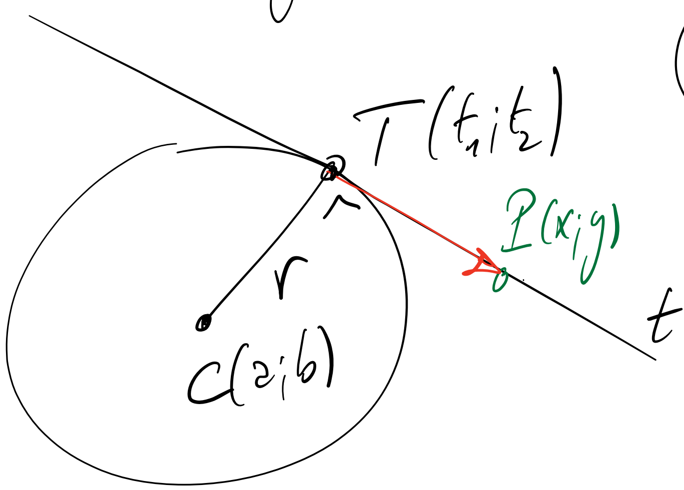
biss. $\quad a_1x + b_1y + c_1 = 0 \quad$ et $\quad a_2x + b_2y + c_2 = 0$

$$\frac{a_1x + b_1y + c_1}{\sqrt{a_1^2 + b_1^2}} = \pm \frac{a_2x + b_2y + c_2}{\sqrt{a_2^2 + b_2^2}} \longrightarrow \begin{matrix} b_1 \\ b_2 \end{matrix}$$

$$(x-a)^2+(y-b)^2=r^2$$

$$t:\ (t_1-a)(x-a)+(t_2-b)(y-b) = r^2$$

Tangente



$$\overrightarrow{TP}\cdot\overrightarrow{CT}=0$$

$$\begin{pmatrix} x-t_1 \\ y-t_2 \end{pmatrix}\cdot\begin{pmatrix} t_1-a \\ t_2-b \end{pmatrix}=0$$

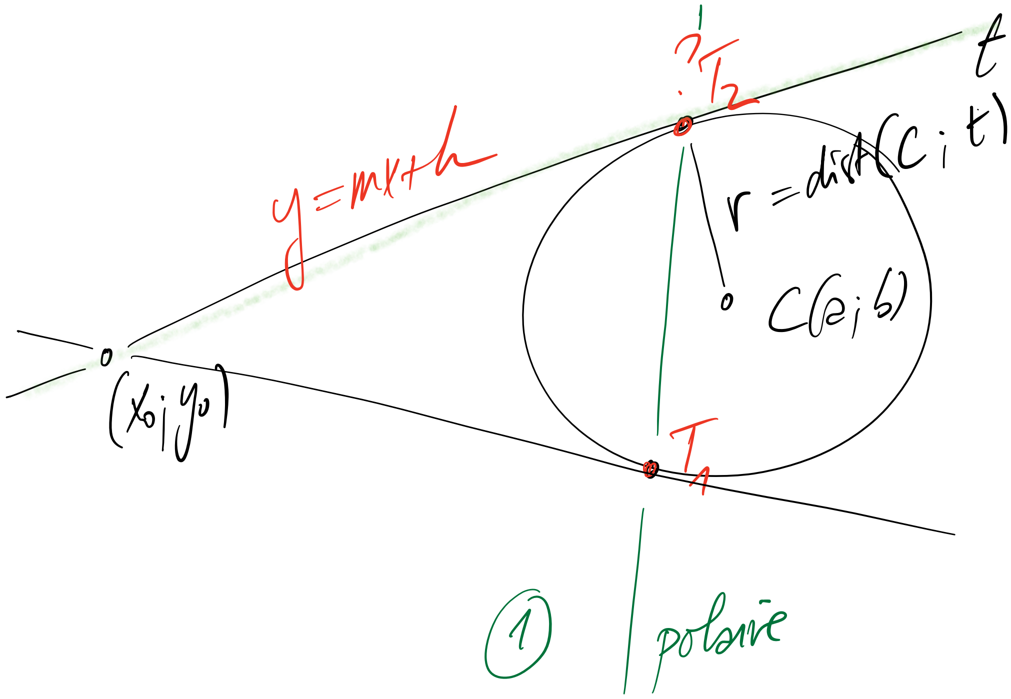
$$(x-t_1)(t_1-a)+(y-t_2)(t_2-b)=0$$

$$(\boxed{x-a}+\boxed{a-t_1})(t_1-a)+(\boxed{y-b}+\boxed{b-t_2})(t_2-b)=0$$

$$(x-a)(t_1-a)+(y-b)(t_2-b)+(a-t_1)(t_1-a)+(b-t_2)(t_2-b)=0$$

$$(x-a)(t_1-a)+(y-b)(t_2-b)=\underbrace{(t_1-a)^2+(t_2-b)^2}_{r^2}$$

$$(x-a)(t_1-a)+(y-b)(t_2-b)=r^2$$



$(x_0;y_0)\in t$

$(x-a)^2+(y-b)^2=r^2$

① polaire

② $t: y=mx+h \Leftrightarrow mx-y+h=0$

$$\frac{|ma-b+h|}{\sqrt{m^2+1}}=r$$

dist. $(C;t)$

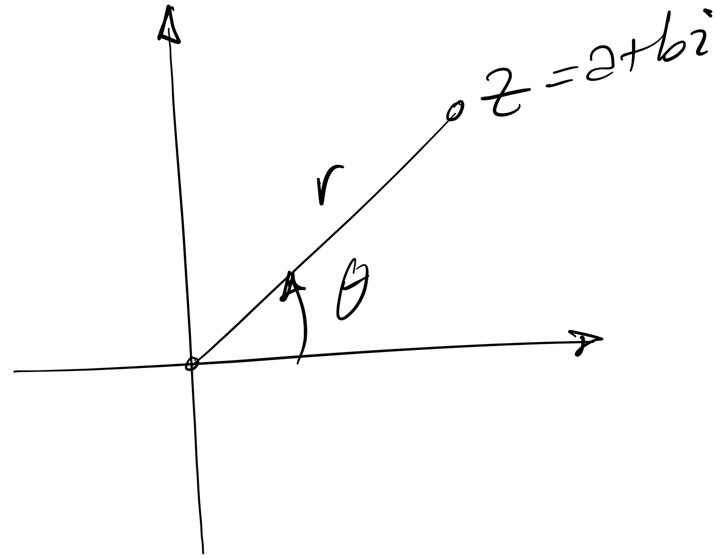
$(x_0;y_0)\in t$

$y_0=mx_0+h$

$h=y_0-mx_0$

$$\boxed{\frac{|ma-b+y_0-mx_0|}{\sqrt{m^2+1}}=r}$$

$\sqrt[5]{z}$ $\quad z \in \mathbb{C}$



$r = \sqrt{a^2+b^2}$

$\theta \in [0; 2\pi[$

$z = [r; \theta] = [2^5; \pi]$

<u>Thm:</u> $z^n = [r; \theta]^n = [r^n; n\theta]$

$w = \sqrt[5]{z} \qquad w^5 = z$

$w = [s; \varphi] \qquad [s^5; 5\varphi] = [r; \theta + k \cdot 2\pi]$

$s^5 = r \quad s, r > 0 \Rightarrow s = \sqrt[5]{r} \in \mathbb{R}$

$5\varphi = \theta + k \cdot 2\pi$

$\varphi = \dfrac{\theta + k \cdot 2\pi}{5} \qquad k = 0, 1, 2, 3, 4 \qquad k \in \mathbb{Z}_5$

$\varphi = \dfrac{\theta}{5} + k \cdot \dfrac{2\pi}{5}$

Ensemble des $\sqrt[5]{}$ de $z = [r ; \theta]$

$$\left\{ \left[\sqrt[5]{r} ; \frac{\theta}{5}\right] ; \left[\sqrt[5]{r} ; \frac{\theta}{5} + \frac{2\pi}{5}\right] ; \left[\sqrt[5]{r} ; \frac{\theta}{5} + \frac{4\pi}{5}\right] ; \right.$$

$$\left. \left[\sqrt[5]{r} ; \frac{\theta}{5} + \frac{6\pi}{5}\right] ; \left[\sqrt[5]{r} ; \frac{\theta}{5} + \frac{8\pi}{5}\right] \right\}$$