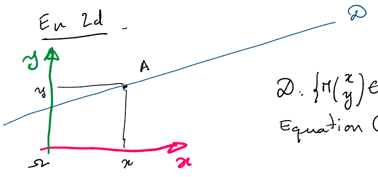
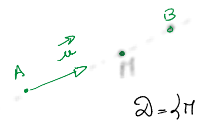
En 2d



$\mathcal{D} : \{ M\binom{x}{y} \in \mathbb{R}^2 \text{ tq } y = ax + b \}$

Equation Cartésienne de $\mathcal{D}$

Totalement inutile



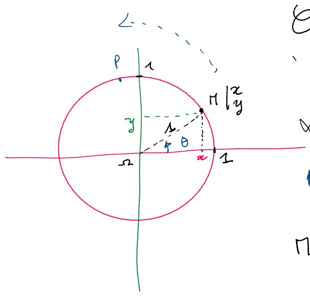
$A \left| \begin{matrix} x_a \\ y_a \end{matrix} \right. \quad B \left| \begin{matrix} x_b \\ y_b \end{matrix} \right. \quad \vec{u} = \frac{\vec{AB}}{\|\vec{AB}\|}$

$\mathcal{D} = \{ M \in \mathbb{R} \text{ tq } \exists t \in \mathbb{R} \ \vec{AM} = t\vec{AB} \}$

$\{ \text{- - - - - -} \exists t' \text{ ——— } M = A + t'\vec{u} \}$

$\boxed{\begin{cases} x = x_a + t x_u \\ y = y_a + t y_u \end{cases}}$ Equat° Paramétique.

$\mathcal{C}_0$: cercle de rayon 1, centré sur $\Omega \left| \begin{matrix} 0 \\ 0 \end{matrix} \right.$



Eq. Cartésienne . $f(x,y) = 0$

$x^2 + y^2 = r^2$

Param. : angle $\theta_M = (\widehat{\vec{\Omega x}, \vec{\Omega M}})$

$M \in \mathcal{C}_0 \Leftrightarrow \begin{cases} x = r.\cos\theta \\ y = r.\sin\theta \end{cases}$

Eq. Cartesienne en dim 3

$M\begin{pmatrix} x \\ y \\ z \end{pmatrix}$

objet de $\mathbb{R}^3$ $f(x,y,z) = 0$

$\to f(x_1, \ldots, x_n) = 0$

Equat° Paramétrique

système de n équations liant les n coordonnées à $(n-1)$ paramètres

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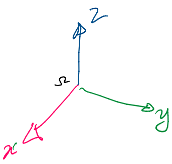
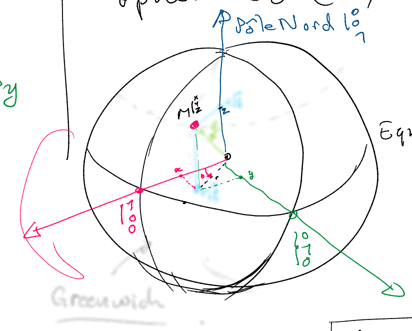


Sphère $\mathcal{S}_0(\Omega, 1)$



$M \left| \begin{matrix} x \\ y \\ z \end{matrix} \right.$ Eq. Cartésienne. $\boxed{x^2 + y^2 + z^2 = 1}$

P : proj. de M sur $(z=0)$

$P \left| \begin{matrix} x = r.\cos\theta \\ y = r.\sin\theta \\ 0 \end{matrix} \right.$

$\theta =$ "Longitude"

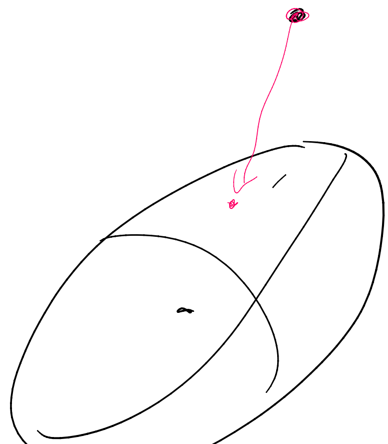
$\Rightarrow$ que vaut r ??

- $z = \cos\varphi$
- $r = \sin\varphi$

Eq. Param. de $\mathcal{S}_0$: $\boxed{\begin{cases} x = \cos\theta.\sin\varphi \\ y = \sin\theta.\sin\varphi \\ z = \cos\varphi \end{cases}}$

Coord. sphérique.

$\theta =$ "Longitude"
$\varphi =$ "latitude"



Eq. d'une Sphere de rayon a $\to$ $\begin{cases} x = a.\cos\theta.\sin\varphi \\ y = a.\sin\theta.\sin\varphi \\ z = a.\cos\varphi. \end{cases}$

Sphere de rayon a, centrée sur $C \left| \begin{matrix} x_c \\ y_c \\ z_c \end{matrix} \right.$

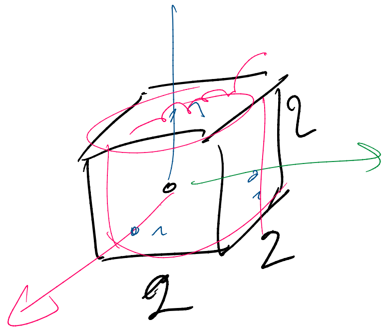
$\begin{cases} x = x_c + a\cos\theta.\sin\varphi \\ y = y_c + a\sin\theta.\sin\varphi \\ z = z_c + a.\cos\varphi \end{cases}$

$$\begin{aligned} \left(\frac{x - x_c}{a}\right) &= \cos\theta.\sin\varphi \\ \left(\frac{y - y_c}{a}\right) &= \sin\theta.\sin\varphi \\ \left(\frac{z - z_c}{a}\right) &= \cos\varphi. \end{aligned}$$

$\mathcal{S}_0$

$\mathcal{E}\left(C, \begin{matrix} r_x \\ r_y \\ r_z \end{matrix}\right)$ Param $\begin{cases} \left(\frac{x - x_c}{r_x}\right) = \cos\theta.\sin\varphi \\ \left(\frac{y - y_c}{r_y}\right) = \sin\theta.\sin\varphi \\ \left(\frac{z - z_c}{r_z}\right) = \cos\varphi. \end{cases}$

Cart. $\left(\frac{x - x_c}{r_x}\right)^2 + \left(\frac{y - y_c}{r_y}\right)^2 + \left(\frac{z - z_c}{r_z}\right)^2 = 1$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