d'où $\vec{OM} = \dfrac{1}{\Delta}\left[x\beta_2\vec{I} - \underbrace{x\alpha_2\vec{J} + y\alpha_1\vec{J}} - y\beta_1\vec{I}\right]$

$$\vec{OM} = \frac{1}{\Delta}\left[(\beta_2 x - \beta_1 y)\vec{I} + (\alpha_1 y - \alpha_2 x)\vec{J}\right]$$

$$\Longrightarrow \begin{cases} X = \dfrac{1}{\Delta}(\beta_2 x - \beta_1 y) \\ Y = \dfrac{1}{\Delta}(\alpha_1 y - \alpha_2 x) \end{cases}$$

$$\begin{cases} \begin{pmatrix} X \\ Y \end{pmatrix} = \dfrac{1}{\Delta}\begin{pmatrix} \beta_2 & -\beta_1 \\ -\alpha_2 & \alpha_1 \end{pmatrix}\begin{pmatrix} x \\ y \end{pmatrix} = P\begin{pmatrix} x \\ y \end{pmatrix} \\ \Delta = \alpha_1\beta_2 - \beta_2\alpha_1 \end{cases}$$

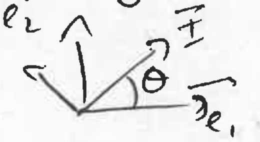
P^{-1} ? Essayez $\begin{pmatrix} \alpha_1 & \beta_1 \\ \alpha_2 & \beta_2 \end{pmatrix}$

d'où $\begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} \alpha_1 & \beta_1 \\ \alpha_2 & \beta_2 \end{pmatrix}\begin{pmatrix} X \\ Y \end{pmatrix}$

$\uparrow$ $\vec{I}$ dans $(\vec{e_1}, \vec{e_2})$ $\qquad$ $\vec{J}$ dans $(\vec{e_1}, \vec{e_2})$

$\Rightarrow$ Matrice de Passage ou de changement de repère

$R_{\theta=\frac{\pi}{6}}$?



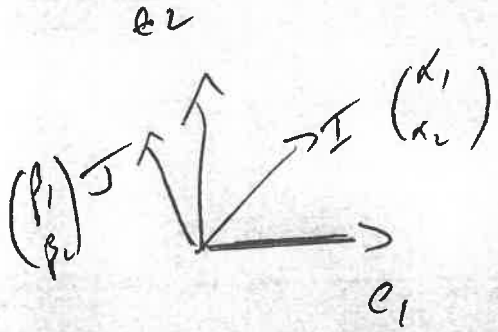
$\vec{I} = \begin{pmatrix} \cos\frac{\pi}{6} \\ \sin\frac{\pi}{6} \end{pmatrix}$ $\quad$ $\vec{J} = \begin{pmatrix} -\sin\frac{\pi}{6} \\ \cos\frac{\pi}{6} \end{pmatrix}$

$$R_{\theta=\frac{\pi}{6}} = \begin{pmatrix} \cos\frac{\pi}{6} & -\sin\frac{\pi}{6} \\ \sin\frac{\pi}{6} & \cos\frac{\pi}{6} \end{pmatrix}$$

$\uparrow$ $\vec{I}$ $\qquad$ $\vec{J}$

$R_{\theta=\frac{\pi}{6}}\left(M\begin{pmatrix} x \\ y \end{pmatrix}\right) = M'\begin{pmatrix} X \\ Y \end{pmatrix}$ avec $\begin{pmatrix} X \\ Y \end{pmatrix} = R_\theta\begin{pmatrix} x \\ y \end{pmatrix}$

Δ ? $\Delta = 1$ $\qquad$ $\left(R_{\theta=\frac{\pi}{6}}\right)^{-1} = R_{(\theta=-\frac{\pi}{6})} = {}^tR_\theta = \begin{pmatrix} \cos\frac{\pi}{6} & \sin\frac{\pi}{6} \\ -\sin\frac{\pi}{6} & \cos \end{pmatrix}$



$$\overrightarrow{OM} = x\,\vec{e_1} + y\,\vec{e_2} \quad (1)$$

$$\overrightarrow{OI} = \alpha_1\vec{e_1} + \alpha_2\vec{e_2} \quad (2)$$

$$\overrightarrow{OJ} = \beta_1\vec{e_1} + \beta_2\vec{e_2} \quad (3)$$

β_2 (2) et α_2 (3)

donne

$$\beta_2\vec{I} = \beta_2\alpha_1\vec{e_1} + \beta_2\alpha_2\vec{e_2} \quad (4)$$

$$\alpha_2\vec{J} = \beta_1\alpha_2\vec{e_1} + \alpha_2\beta_2\vec{e_2} \quad (5)$$

(4) − (5) donne $\beta_2\vec{I} - \alpha_2\vec{J} = (\beta_2\alpha_1 - \beta_1\alpha_2)\vec{e_1}$

de façon symétrique $\beta_1\vec{I} - \alpha_1\vec{J} = (\beta_1\alpha_2 - \alpha_1\beta_2)\vec{e_2}$

donc $\vec{e_1} = \dfrac{1}{\alpha_1\beta_2 - \alpha_2\beta_1}\left[\beta_2\vec{I} - \alpha_2\vec{J}\right]$

$$\vec{e_2} = \frac{1}{\alpha_1\beta_2 - \alpha_2\beta_1}\left[\alpha_1\vec{J} - \beta_1\vec{I}\right]$$