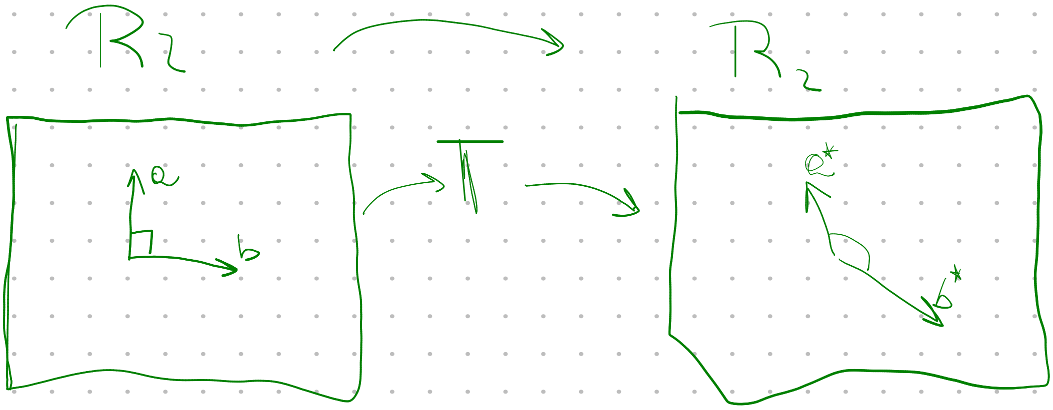
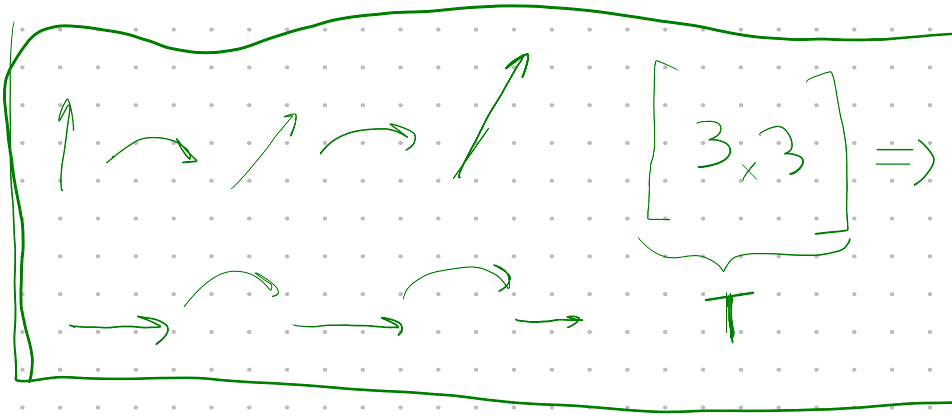
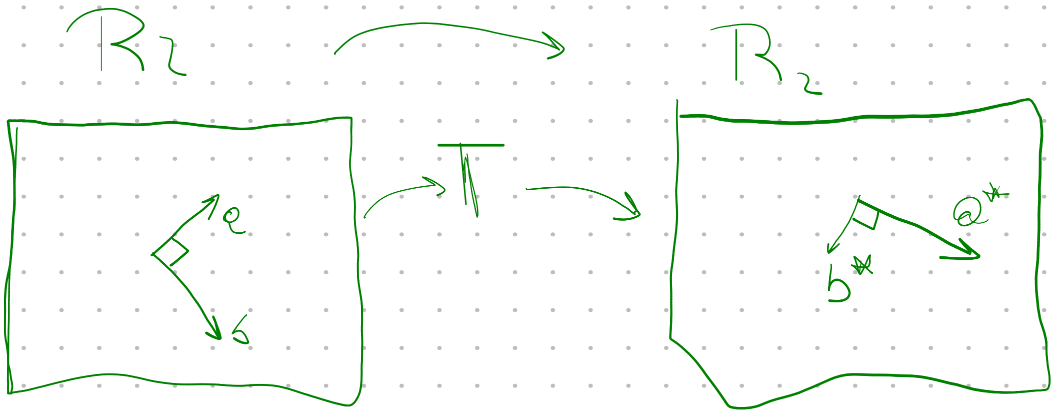
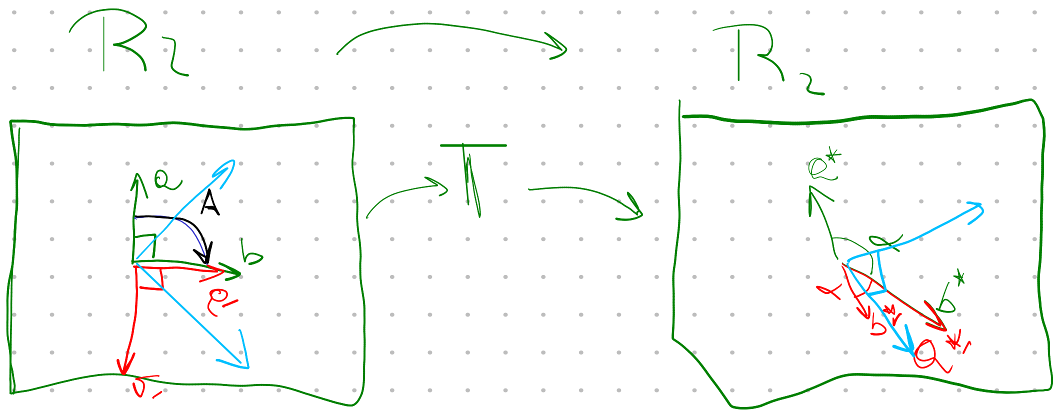


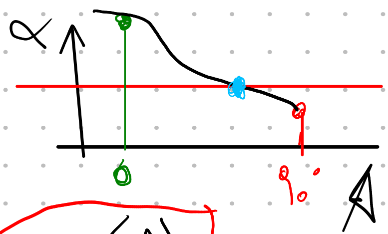


un autovector
es un vector
que al aplicar
la transformación
no rota, solo se
escala.



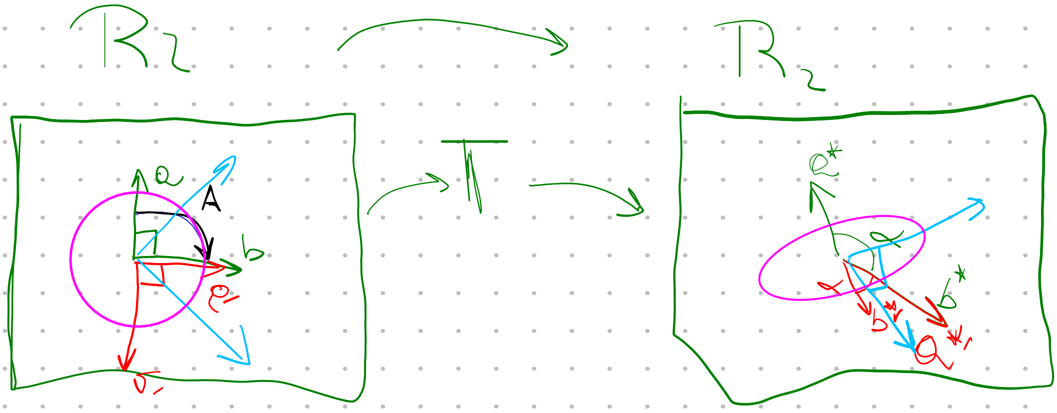


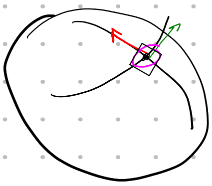
$$\cos(A) = \frac{\underline{a} \cdot \underline{a}'}{\|\underline{a}\|^2}$$

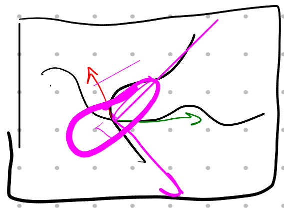


$\underline{a}^* \cdot \underline{b}^* = \emptyset$

$\alpha(A)$ continua.







$\left(\underline{\lambda}, \underline{\varphi}\right)$ vs $\left(\underline{\hat{\lambda}}, \underline{\hat{\varphi}}\right)$

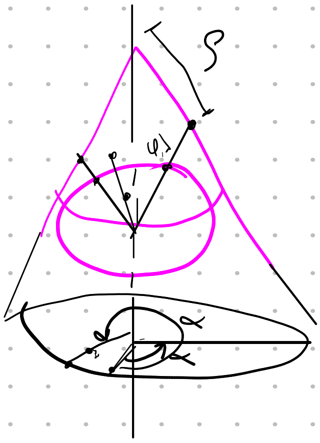
$$\frac{\partial \underline{r}}{\partial \lambda} \qquad \frac{\partial \underline{\hat{r}}}{\partial \lambda \circ \varphi}$$

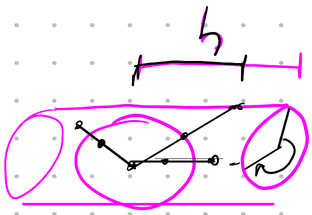
Proyecciones

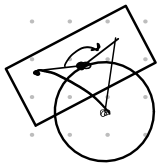
- Figura Auxiliar
  (conicas, cilindricas, azimutales)

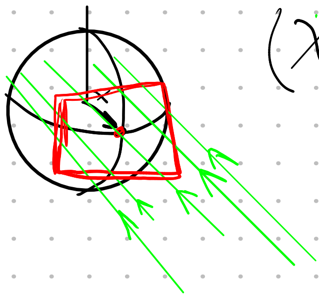
- Prop. de Deformación
  (conformes, equivalentes, equidistantes)

- Posicion de la figura auxiliar
  (secantes, tangentes, oblicuas, normales, transversales)





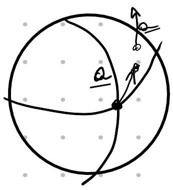


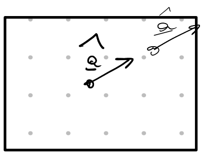


(x, y, z) son las canonicas de R3

X_r2 = Z_r3 = R sen(lat)
Y_r2 = Y_r3 = R sen(lat) cos(lon)

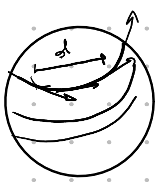
Equidistantes (en una dirección)

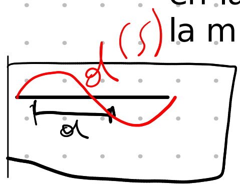




$$\frac{\| a \|}{\| \hat{a} \|} = k$$

hay definida una/s direccion/es en las que la escala es siempre la misma.



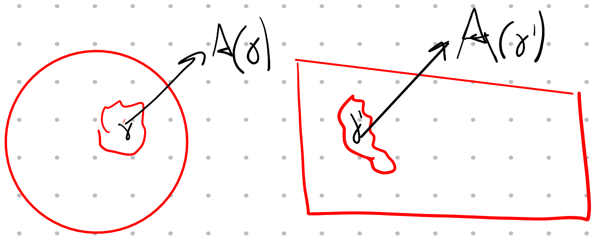


eqd segun x linea

x linea es una linea estandar.

$a = \varphi \circ \lambda \quad \circ \ldots$ la dirección q' la fig. aux defina.

Equivalencia

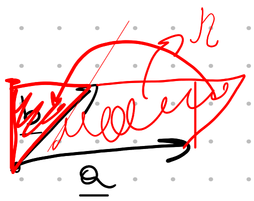


$$\left\|\begin{matrix}\frac{\partial\varphi}{\partial x} & \frac{\partial\lambda}{\partial x}\\ \frac{\partial\varphi}{\partial y} & \frac{\partial\lambda}{\partial y}\end{matrix}\right\|$$

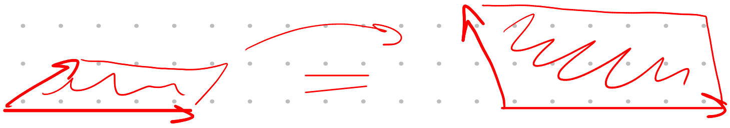
$$\iint_{\gamma(\varphi,\lambda)} \underbrace{R^2\cos\varphi}_{Je}\, d\varphi\, d\lambda = \iint_{\gamma'(\varphi,\lambda)} J(\varphi,\lambda \to x,y)\, d\varphi\, d\lambda$$

$$\iint_{\gamma'(x,y)} dx\, dy$$

$$J = |\hat{\underline{\varphi}} \times \hat{\underline{\lambda}}| \qquad \boxed{Je = |\underline{\varphi} \times \underline{\lambda}|}$$



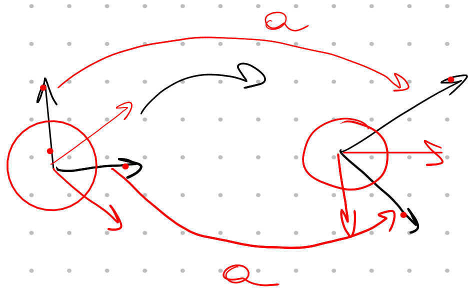
$$|\underline{b} \times \underline{a}| = \overbrace{A}^{\operatorname{sen}(\alpha)\cdot\|\underline{b}\|\,\|\underline{a}\|}(h)$$



$$|\underline{\varphi} \times \underline{\lambda}| = |\hat{\underline{\lambda}} \times \hat{\underline{\varphi}}| \quad \forall(\varphi,\lambda) \to \text{ep v.}$$

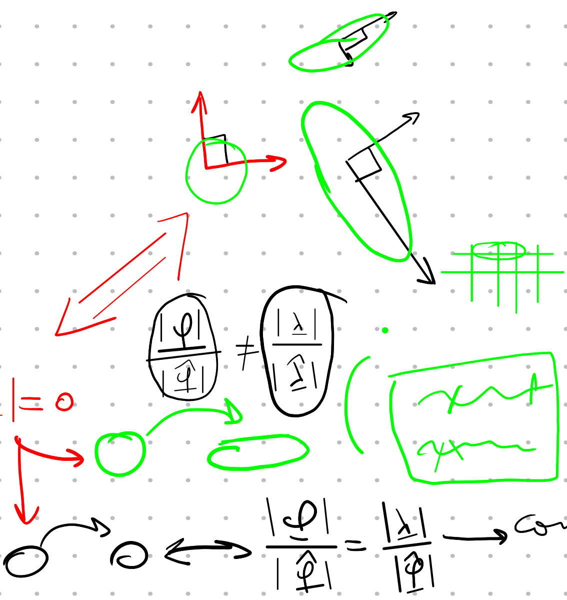
$$\hookrightarrow \frac{\partial x}{\partial \lambda}\cdot\underbrace{\frac{\partial \hat{r}}{\partial x}}_{\hat{\underline{e}}_x} + \frac{\partial y}{\partial \lambda}\underbrace{\frac{\partial \hat{r}}{\partial y}}_{\hat{\underline{e}}_y}$$

Conformidad.



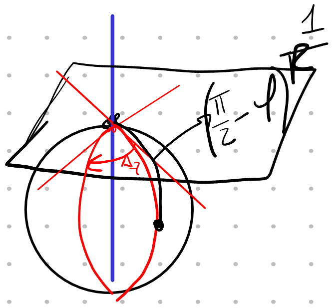
$$|\underline{\varphi}\cdot\underline{\lambda}| = 0 \checkmark$$

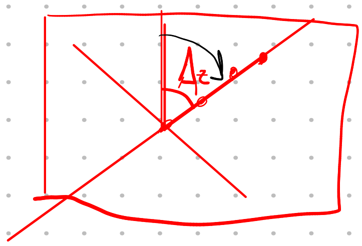
$$|\hat{\underline{\varphi}}\cdot\hat{\underline{\lambda}}| \neq 0 \to$$ no hay.

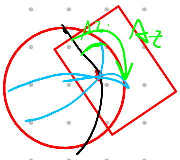


$$|\hat{\underline{\varphi}}\cdot\hat{\underline{\lambda}}| = 0 \qquad \frac{|\underline{\varphi}|}{|\hat{\underline{\varphi}}|} \neq \frac{|\underline{\lambda}|}{|\hat{\underline{\lambda}}|}$$

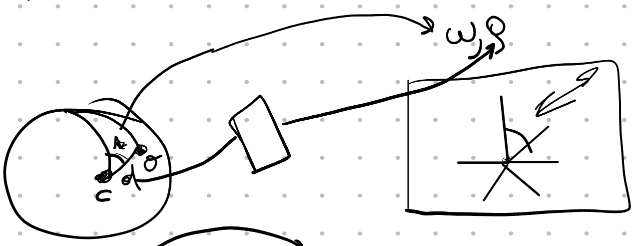
$$\longleftrightarrow \frac{|\underline{\varphi}|}{|\hat{\underline{\varphi}}|} = \frac{|\underline{\lambda}|}{|\hat{\underline{\varphi}}|} \longrightarrow \text{conf.}$$







azimut es la dirección de una linea, en un punto medida con respecto a $\underline{\varphi}$



ω, ρ

$$\omega = \lambda$$

$$\rho = f(\delta)$$

$$\rho(\delta = 0) = 0 \qquad \varphi = \pi/2$$

$$\lambda, \varphi \xrightarrow{R_3} \lambda, \left(\frac{\pi}{2} - \varphi\right) \xrightarrow{R_3} \lambda, \rho(\delta)$$

δ

$\hat{\lambda}; \hat{\rho} \rightarrow \underline{e_y}, \underline{e_x}; \underline{e_z}$

$$\frac{\partial \rho}{\partial \delta} = ?$$

$$x, y \leftrightarrow \omega, \rho$$

$$\hat{\omega}; \hat{\rho} \rightarrow \hat{e}_x; \hat{e}_y$$

$$\boxed{\begin{aligned} x &= \rho \cdot \cos \omega \\ y &= \rho \operatorname{sen} \omega \end{aligned}}$$

Aplicación:
Manteniendo los parámetros, cambié la base vectorial.

$R \cos \varphi$

$$\|\underline{\lambda}\| \times \|\underline{\rho}\| \cdot \cancel{\operatorname{sen}(90°)} = \underbrace{\|\hat{\underline{\omega}}\| \times \|\hat{\underline{\rho}}\|}_{\rho} \times \cancel{\operatorname{sen}(90°)}$$

$$|\underline{\lambda} \times \underline{\rho}| = |\hat{\underline{\omega}} \times \hat{\underline{\rho}}|$$

$$\underline{\rho} \parallel \underline{\delta}$$

$$\frac{\partial r}{\partial \rho} = \frac{\partial r}{\partial \theta_{\lambda,\varphi}} \frac{\partial \theta_{\lambda,\varphi}}{\partial \rho}$$

$$\left\| \frac{\partial r}{\partial \lambda} \cancel{\frac{\partial \lambda}{\partial \rho}} + \frac{\partial r}{\partial \varphi} \cdot \frac{\partial \varphi}{\partial \rho} \right\|$$

$$\cancel{\frac{\partial \varphi}{\partial \rho}}$$

$$\|\underline{\rho}\| = \frac{\partial \varphi}{\partial \rho} \cdot \|\varphi\|$$

$$\frac{1}{\frac{\partial \rho}{\partial \varphi}}$$

$$R \cos \varphi \cdot \frac{\partial \varphi}{\partial \rho} R = \rho$$

$\rho(\varphi)$

$$\boxed{\int R \cos \varphi \cdot d\varphi \, R = \int \rho \, d\rho} \rightarrow \rho(\varphi) = \underbrace{\ldots}_{\varphi = 90} + C = 0$$

$\rho_0 \qquad \partial$

λ, φ

$$R_3 \updownarrow R_2$$

$$\lambda, \varphi \longrightarrow \varphi, \lambda$$

$$x, y \longleftarrow \omega, \rho \longleftarrow \lambda, \rho \longleftarrow \varphi, \lambda$$

$$\underbrace{|\hat{\varphi} \times \hat{\lambda}|} = \underbrace{|\lambda \times \varphi|}_{R^2 \cos\varphi}$$

$$\begin{matrix} x(\varphi, \lambda) \longrightarrow \\ y(\varphi, \lambda) \end{matrix}$$