$$a_i^{k} b_{kj} = \sum_k a_{ik} b_{kj}$$

$a_{ik} b_{kj}$ ó $a_i^k b_j^k$ no es suma.

$$x_{ij} = \Gamma_{ij}^1 x_1 + \Gamma_{ij}^2 x_2 + h_{ij} N \qquad (1)$$

$i,j = 1,2$

$$= \sum_{k=1}^{2} \Gamma_{ij}^k x_k + h_{ij} N$$

$$\Rightarrow \boxed{x_{ij} = \Gamma_{ij}^k x_k + h_{ij} N} \qquad i,j = 1,2$$

$A = (a_{ij})_{n\times n} \quad B = (b_{ij})_{n\times n} \quad C = AB = (c_{ij})$

$$c_{ij} = \sum_{k=1}^{n} a_{ik} b_{kj}$$

$$\Rightarrow \boxed{c_{ij} = a_i^{\;k} b_{kj}}$$

delta de Kronecker

Si A y B son inversas $\Rightarrow C = AB = I_{n\times n} \Rightarrow c_{ij} = \delta_{ij} = \begin{cases} 1; & i=j \\ 0; & i\neq j \end{cases}$

$$\Rightarrow a_i^{\;k} b_{kj} = \delta_{ij}$$

En el caso G y G^{-1}:

$$\boxed{g_{ik}\, g^{kj} = \delta_{ij}}$$

$$g^{\ell p} g_{\ell k} \Gamma_{ij}^{k} = \sum_{\ell} \sum_{k} g^{\ell p} g_{\ell k} \Gamma_{ij}^{k}.$$

$$(3) \quad \Gamma_{ij}^{k} = g^{\ell k} \langle x_{ij}, x_\ell \rangle \quad = \sum_{\ell} g^{\ell k} \langle x_{ij}, x_\ell \rangle$$

$$(4) \quad \partial_k x_{ij} - \partial_j x_{ik} + \partial_i x_{jk} = 2 \langle x_{ik}, x_j \rangle \qquad k \leftarrow j$$

$$\partial_j x_{i\ell} - \partial_\ell x_{ij} + \partial_i x_{\ell j} = 2 \langle x_{ij}, x_\ell \rangle \qquad j \leftarrow \ell$$

$$\Rightarrow \boxed{\Gamma_{ij}^{k} = \frac{1}{2} g^{\ell k} \left(\partial_i x_{j\ell} + \partial_j x_{i\ell} - \partial_\ell x_{ij} \right)}$$