e) $\alpha \in \mathbb{R}$, $(\alpha f)\otimes g = \alpha(f \otimes g)$

*Ejemplos:

$\mathbb{R}^2$ $\quad B=\{e_1, e_2\}$, $B^*=\{e_1^*, e_2^*\}$

$T^1(E)=\{f: E^* \to K=\mathbb{R}$ lineales$\} = \boxed{E^{**}=E}$

$T^2(E) \ni e_1 \otimes e_2$

$(e_1 \otimes e_2)(e_1^*, e_1^*) = e_1(e_1^*)\cdot e_2(e_1^*) = 0$

$(e_1^*, e_2^*) = 1$
$(e_2^*, e_1^*) = 0$
$(e_2^*, e_2^*) = 0$

→ Quan tenim $f \in E^*$ $(E=\mathbb{R}^3)$:

$(\mathbb{R}^3)^*$ $\quad \mathbb{R}^3$ $\quad B=$

$(2,1,5)\cdot\begin{pmatrix}3\\1\\4\end{pmatrix} = x \in \mathbb{R}=K$

És el mateix pensat que A opera a B (a(b)) o que B opera a A (b(a)) i per tant la matriu $B \in E^{**} \to E = E^{**}$.

→ Obs:

1) E K-ev. dim n, $B=\{e_1, \dots, e_n\}$

$$(\underbrace{e_{i_1}^* \otimes \dots \otimes e_{i_p}^*}_{I=\{i_1,\dots,i_p\}} \otimes \underbrace{e_{j_1} \otimes \dots \otimes e_{j_q}}_{J=\{j_1,\dots,j_q\}})(\underbrace{e_{l_1},\dots,e_{l_p}}_{L=\{l_1,\dots,l_p\}}, \underbrace{e_{m_1}^*,\dots,e_{m_q}^*}_{M=\{m_1,\dots,m_q\}}) = \begin{cases} 1 & \text{si } \overbrace{I=L, J=M}^{\text{los índices}} \\ 0 & \text{otherwise} \end{cases}$$

2) $f, g \in T_p^q(E)$

$f=g \iff \forall e_{i_1},\dots,e_{i_p} \in B$, $\forall e_{j_1}^*,\dots,e_{j_q}^* \in B^*$ $\quad f(e_{i_1}, \_, e_{j_q}^*) = g(e_{i_1}, \_, e_{j_q}^*)$

per multilinealitat de f i g.