3. Asumamos que para T_1, $V_1=(0,0)$, $V_2=(1,1)$ y $V_3=(-1,2)$

Luego se tendría que:

$$\phi_1^{T_1}(0,0)=1=a$$

$$\left.\begin{aligned}\phi_1^{T_1}(1,1)=0=1+b+c\\ \phi_1^{T_1}(-1,2)=0=1-b+2c\end{aligned}\right\}\begin{aligned}b+c&=-1\\-b+2c&=-1\end{aligned}\Bigg\}\begin{aligned}c&=-2/3\\b&=-1/3\end{aligned}$$

Luego

$$\phi_1^{T_1}(x,y)=1-\tfrac{1}{3}x-\tfrac{2}{3}y \qquad \nabla\phi_1^{T_1}(x,y)=\left(-\tfrac{1}{3},-\tfrac{2}{3}\right)$$

Así mismo para T_2

$$\left.\begin{aligned}\phi_1^{T_2}(0,0)=1=a\\ \phi_1^{T_2}(1,0)=0=1+b\rightarrow b=-1\\ \phi_1^{T_2}(1,1)=0=1-1+c\rightarrow c=0\end{aligned}\right\}\begin{aligned}\phi_1^{T_2}(x,y)&=1-x\\ \nabla\phi_1^{T_2}(x,y)&=(-1,0)\end{aligned}$$