Ej. 8 Examen 2019 - 02

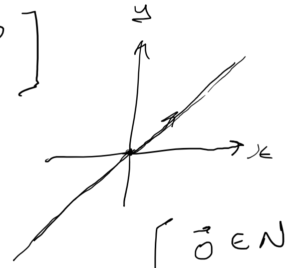
$T(x,y,z) = (x-y,\, x-y,\, z)$

$T(x,y,z) = (0,0,0) = (x-y,\, x-y,\, z) \to (1,1,0)$, $(0,0,1)$

$$\begin{cases} x-y=0 \\ x-y=0 \\ z=0 \end{cases} \Rightarrow \begin{matrix} \to z=0 \\ \to x=y \end{matrix}$$

$(x, x, 0)$

$\to (1,1,0)$



$\underset{3}{\dim \mathbb{R}^3} = \underset{1}{\dim N(T)} + \dim Im(T)$

$\Downarrow$

$\dim Im(T) = 2$

PLANO

$$\begin{cases} \vec{0} \in N(T) \\ \vec{0} \in Im(T) \end{cases}$$

$T(x,y) = (x+1,\, y) \to T(0,0) \neq (0,0)$

$\Rightarrow T$ no es lineal.

$_{\mathcal{E}'}(S \circ T)_{\mathcal{E}} = {}_{\mathcal{E}'}(S)_B \cdot {}_B(T)_{\mathcal{E}}$

Ej. 1 parte b, Tanda 1, Segunda prueba virtual, Primer semestre 2020

$\to S(1)$

$\to S(x)$

$S(x^3+x^2+2x) = S(x^3) + S(x^2) + 2S(x) = (\quad)$

$S(x^3-x^2) = S(x^3) - S(x^2)$

x^3+2x+1

$$\left(\begin{array}{ccc|c} 1 & 1 & 0 & a \\ 0 & 1 & 3 & b \\ 2 & 0 & 0 & c \\ 1 & 0 & -1 & d \end{array}\right)$$

Sistema a resolver Ej. 2 Examen 2018 - 12

$S_1: (x, y, -x-y) \to (1,0,-1), (0,1,-1)$

Ej. 6 Segundo parcial, Primer semestre 2014

$S_2: (x, x, 2x) \to (1,1,2)$

$\underset{\in \mathbb{R}^3}{(a,b,c)} = \underset{\in S_1}{(x, y, -x-y)} + \underset{\in S_2}{(z, z, 2z)}$

$$\begin{cases} a = x+z \\ b = y+z \\ c = -x-y+2z \end{cases} \quad a+b+c = 4z$$

$$\begin{cases} z = \dfrac{a+b+c}{4} \\ y = \dfrac{-a+3b-c}{4} \\ x = \dfrac{3a-b-c}{4} \end{cases}$$

$(1,1,1) = \underbrace{(1/4, 1/4, -1/2)}_{S_1} + \underbrace{(3/4, 3/4, 3/2)}_{S_2}$

$v = S_1 + S_2$

$(z, z, 2z)$

$\underbrace{\left(\frac{a+b+c}{4}, \frac{a+b+c}{4}, \frac{a+b+c}{2}\right)}_{\in S_2}$

$(a,b,c) = (x, y, -x-y) + S_2$

$\to \left(\frac{3a-b-c}{4}, \frac{-a+3b-c}{4}, \frac{-2a-2b+2c}{4}\right) \in S_1$

$T(v) = 4S_1$

$T(a,b,c) = (3a-b-c,\, -a+3b-c,\, -2a-2b+2c)$

$T(1,-1,0) = (4, -4, 0)$

$T(1,1,0) = (2, 2, -4)$ $\Rightarrow {}_{\mathcal{E}}(T)_B = \begin{pmatrix} 4 & 2 & 0 \\ -4 & 2 & 0 \\ 0 & -4 & 0 \end{pmatrix}$

$T(1,-1,0) = (4, -4, 0)$

$T(1,1,0) = (2, 2, -4)$ $\Rightarrow \mathcal{C}(T)_B = \begin{pmatrix} 4 & 2 & 0 \\ -4 & 2 & 0 \\ 0 & -4 & 0 \end{pmatrix}$

$T(1,1,2) = (0, 0, 0)$

$\left| \begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix} \right| = 1$

$|A^t| = |A|$ $\det\begin{pmatrix} a & b \\ c & d \end{pmatrix}$ $\begin{pmatrix} a & d & e \\ d & b & f \\ e & f & c \end{pmatrix} = B \longrightarrow B^{-1}$

Matriz en bloques

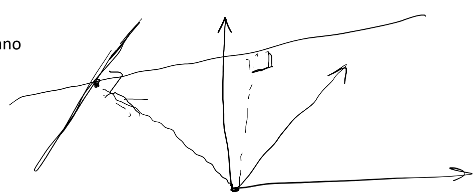
$M = \begin{pmatrix} \boxed{A} & \boxed{B} \\ \boxed{0} & \boxed{D} \end{pmatrix}$ $\det(M) = \det(A) \cdot \det(D)$

Escalerización

$\left(\begin{array}{c|c} & a \\ & b \\ & c \\ & d \end{array}\right) \xrightarrow{F_3 = F_3 - F_2} \left(\begin{array}{c|c} & a \\ & b \\ & c-b \\ & d \end{array}\right)$

$A \longrightarrow A'$ (= escal.)

Vector normal a un plano



$ax + by + cz = d$

$\vec{n} = (a, b, c)$