Math 290 Monday, April 26

Problem Session Evaluations

Tue- Exam LT Laptop Scge

Thu- Problems VR, MR

Fri- CB RQ

BYOB - Summer

LT. C30

$T: \mathbb{C}^3 \to \mathbb{C}^2$

$$T\left(\begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix}\right) = \begin{bmatrix} 2x_1 - x_2 + 5x_3 \\ -4x_1 + 2x_2 - 10x_3 \end{bmatrix}$$

$$T^{-1}\left(\begin{bmatrix} 2 \\ 3 \end{bmatrix}\right)$$

$$T\left(\begin{bmatrix} a \\ b \\ c \end{bmatrix}\right) = \begin{bmatrix} 2 \\ 3 \end{bmatrix}$$

$$\begin{bmatrix} 2a - b + 5c \\ -4a + 2b - 10c \end{bmatrix} = \begin{bmatrix} 2 \\ 3 \end{bmatrix}$$

← system of two equations in 3 variables

$$\left[\begin{array}{ccc|c} 2 & -1 & 5 & 2 \\ -4 & 2 & -10 & 3 \end{array}\right] \xrightarrow{RREF} \left[\begin{array}{ccc|c} 1 & -\frac{1}{2} & \frac{5}{2} & 0 \\ 0 & 0 & 0 & 1 \end{array}\right]$$

no solution

$$T^{-1}\left(\begin{bmatrix} 2 \\ 3 \end{bmatrix}\right) = \{\} = \emptyset$$

$T^{-1}\left(\begin{bmatrix}4\\-8\end{bmatrix}\right)$ $\sim\sim$ $\left[\begin{array}{ccc|c}2 & -1 & 5 & 4\\ -4 & 2 & -10 & -8\end{array}\right]$ $\xrightarrow{\text{RREF}}$ $\left[\begin{array}{ccc|c}1 & -1/2 & 5/2 & 2\\ 0 & 0 & 0 & 0\end{array}\right]$

Solution set: $\begin{bmatrix}2\\0\\0\end{bmatrix} + N(A) = \begin{bmatrix}2\\0\\0\end{bmatrix} + \left\langle \left\{ \begin{bmatrix}1/2\\1\\0\end{bmatrix}, \begin{bmatrix}-5/2\\0\\1\end{bmatrix} \right\} \right\rangle$

In Pre-image

Theorem KPI

Kernel of T