Mo Tu We Th Fr Sa Su

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LEC 13. Review for Exam 1 27

Emphasizes Chapter 3

questions

1. u, v, w in R^7

2. 5×3 U $r=3 \Rightarrow$ ~~$N(A)$~~ $N(U)=\{\vec{0}\}$ or $\begin{bmatrix}0\\0\\0\end{bmatrix}$

3. $B=\begin{bmatrix}u\\2u\end{bmatrix}$ echelon form $\to \begin{bmatrix}u\\0\end{bmatrix}$

$C=\begin{bmatrix}u & u\\ u & 0\end{bmatrix}$ echelon form $\to \begin{bmatrix}u & 0\\ 0 & +u\end{bmatrix}$

$\dim N(C^T)=m-r=10-6=4$ ↑ rank = 6, $m=10$,

4. $Ax=\begin{bmatrix}2\\4\\2\end{bmatrix}$ $x=\begin{bmatrix}2\\0\\0\end{bmatrix}+c\begin{bmatrix}1\\1\\0\end{bmatrix}+d\begin{bmatrix}0\\0\\1\end{bmatrix}$

① $\dim C(A)=1$ A is 3 by 3

$\dim N(A)=2$ $n-r=2 \Rightarrow r=1$

$$A=\left[\begin{array}{c|c|c} 1 & -1 & 0\\ 2 & -2 & 0\\ 1 & -1 & 0\end{array}\right]$$

$Ax=b$ can be solved if b in $C(A)$

b has form $b=c\begin{bmatrix}1\\2\\1\end{bmatrix}$.

5. $B^2=0$, $B=0$? no, ex $\begin{bmatrix}0 & 1\\ 0 & 0\end{bmatrix}$

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6. $B = \begin{bmatrix} 1 & 1 & 0 \\ 0 & 1 & 0 \\ 1 & 0 & 1 \end{bmatrix} \begin{bmatrix} 1 & 0 & -1 & 2 \\ 0 & 1 & 1 & -1 \\ 0 & 0 & 0 & 0 \end{bmatrix}$

3×4

basis for $N(B) \leq R^4$

$N(CD) = N(D)$ if C invertible