

Math 290 Friday, January 29

Section NM

Writing

- two files
- linear@bezer.privacyport.com
- File names!!!
bezer - SLE-2.pdf
- Before class

Exam


- laptop, wireless
- One REF by hand
- Sage matrix(), A.rref()
- Old exams on course page

writing SLE

~~RQ~~ Mon - Problem Session

Tue - Exam SLE

RQ Thu - VO

PDFs test 

Non singular Matrices

A non singular \Leftrightarrow solutions to $LS(A, \underline{0})$ are $\{ \underline{0} \} \Leftrightarrow N(A) = \{ \underline{0} \} \Leftrightarrow A$ row-reduces to I_n

A singular \Leftrightarrow solutions to $LS(A, \underline{0})$ infinite set $\Leftrightarrow N(A) \neq \{ \underline{0} \} \Leftrightarrow A$ does not row-reduce to I_n

cont. repositive

$A \stackrel{\text{iff}}{\Leftrightarrow} B$: $\text{If } A \text{ then } B + \text{If } B \text{ then } A.$

Theorem NMUS

A nonsingular \Leftrightarrow $LS(A, \underline{b})$ has a unique solution for every choice of \underline{b}

(\Leftarrow) Assume $LS(A, \underline{b})$ has unique solution for every \underline{b} .

Choose $\underline{b} = \underline{0}$

So $LS(A, \underline{0})$ has a unique solution, the zero vector.

So A is nonsingular.

(\Rightarrow) A nonsingular, study $LS(A, \underline{b})$ (solve for any \underline{b})

$[A | \underline{b}] \xrightarrow{RREF} \left[\begin{array}{ccc|c} \oplus & & & c_1 \\ & \dots & & \\ & & \oplus & \\ & & & \vdots \\ & & & c_n \end{array} \right]$ one solution \underline{c}

$\underbrace{\hspace{10em}}_{I_n}$