Paroblem set 3.2

 $J = \begin{bmatrix} 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix} \begin{bmatrix} 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix} \begin{bmatrix} 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}$ 

Roth R & U has same MUllsparp

Pivot vouiable + face vouiable = r

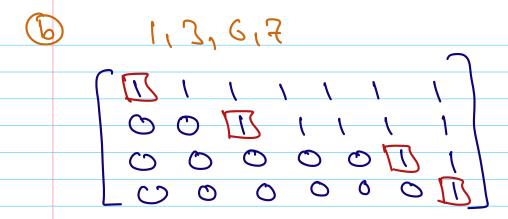
$$\begin{bmatrix} -1 & 3 & 5 \\ 0 & 0 & 0 \end{bmatrix} \xrightarrow{-2} \begin{bmatrix} 1 & -3 & -5 \\ 0 & 0 & 0 \end{bmatrix}$$

$$Special solution = \begin{bmatrix} 3 & 5 \\ 0 & 1 \end{bmatrix}$$

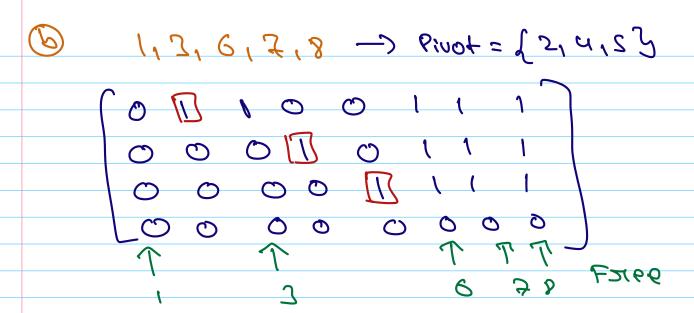
- (5) A square roadsiix has no faree

  Vasiables ? FAISE

  (6) A viewardable makeix has no f
  - 6) A vienerdable matorix has no tree variable? True
  - ever on each xichara nam nA But Toue
  - (d) An men matsux has no more than
    n Pivot Usuiables? True-
  - (6) Out at many 1's at possible who a chelon readour U whose Pivot



ess free Colourn's essert sith



- 3 force vouiable
- 9 dans sort in 28
- The number of specifical rolution's = mar (ii') or = m
  - (iii) strm
- (i) S Pivoh's

$$\begin{bmatrix} 1 & -3 & -1 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix} = 0$$

21918airean asref are Ex 12x

spectial solutions

(13

(14) in a UXS matoix col 1 + col 3 + col 5 = 0 with · 21/0019 2 which coloumn have no pivot? 5 what in the spectral solution? M(A)= C 0 MCA)= C1 2 + C2 1

$$A = \begin{bmatrix} 0 & 1 & -2 & -1 \\ 0 & 1 & -2 & -1 \end{bmatrix}$$

$$SOI^{n}$$

$$= N(A) = C \qquad 3 \qquad n-3n=1$$

$$= 2 \qquad = 3 \qquad 3n=3$$

(17) Constauct a mataix whose column

Space Contain's (1,112) and (0,3,1)

and whose substance contain's (1,112)

$$\sum_{i=1}^{N} N(A) = \begin{bmatrix} 1 \\ 1 \end{bmatrix} C(A) = \begin{bmatrix} 1 \\ 2 \end{bmatrix}$$

$$\begin{bmatrix} 1 & 0 & -\frac{1}{2} \\ 1 & 2 & -2 \end{bmatrix}$$

$$C(A)^{c} \qquad \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix} \qquad A(A)^{c} \begin{pmatrix} 0 & 0 \\ 0 & 1 \end{pmatrix}$$

- noitsquetions aldissonm I

$$C(A) = \begin{bmatrix} 1 \\ 1 \end{bmatrix}$$

$$N(A) = \begin{bmatrix} 1 \\ 1 \end{bmatrix}$$

22) if AD=0 then the colourn Space

af D in contained in the \_\_\_ of

A. Why)

[9]

AB=0
each coloumn of B in in
NOT space of A
(NUII)

Identity.

(24) (a) A and AT have the same NUIISPACE.

$$Ax=0 = 0 = xA$$

$$2S) NCA)= C \begin{pmatrix} 2 \\ 1 \\ 0 \end{pmatrix}$$

what is its mank what is its mank

$$12 = \begin{bmatrix} 1 & 0 & 0 & -2 \\ 0 & 1 & 0 & -1 \\ 0 & 0 & 1 & 0 \end{bmatrix}$$