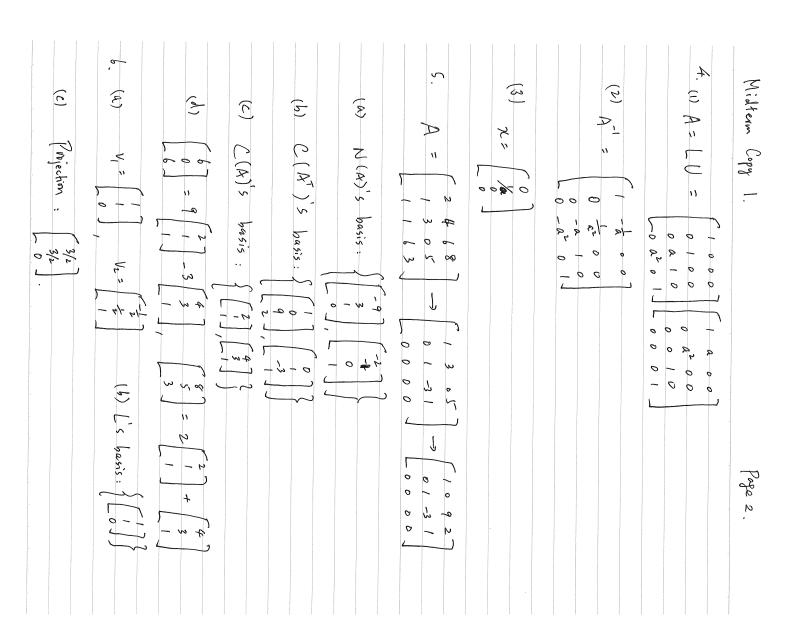
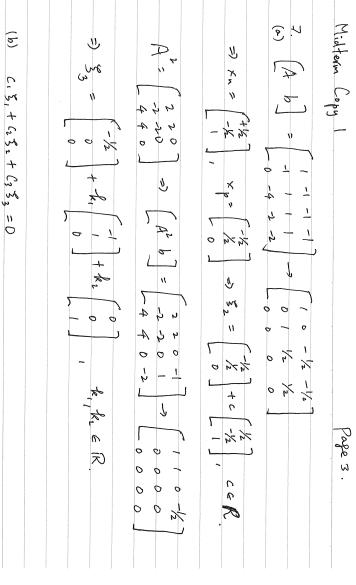
November. 4th, 2021 Dr. Y. Che

| rank $(A) = 2$ . $\Rightarrow$ $4-2a = 0$ $4a+b-5 = 0$ .  Complete solution: $\chi = \begin{bmatrix} 2 \\ -3 \\ 0 \end{bmatrix} + k_1 \begin{bmatrix} -2 \\ 1 \\ 0 \end{bmatrix} + k_2 \begin{bmatrix} 4 \\ 5 \\ 0 \end{bmatrix}$ | independent) | 3. (1) tet 5, 52, 85 he three tireally independent solutions  5:52, 5:-52 linearly independent  Solutions to Ax=0  Also, Vank(A) > 2 -> Yank(A) = 2.  Also, Vank(A) > 2 -> Yank(A) = 2. | (3) $K = LD$<br>(4) $dim N(A^TA) = I$<br>(5) $x = L^{-1}I$ | Midterm Copy 1  Suggested Solutions.  1. DDCBB  2. (1) [a b], a, b c R |
|---|--------------|---|--|--|
|   |              |   |  | Page 1. 2/14 Fall 2021   |





$$A5_1 = 0$$
  $A^2(c, 5, + c, 5) = A^2o$ 

$$A5_2 = 5_1 \qquad \Rightarrow c_3 = 0 \qquad A(c, 5, + c, 5_2) = 0$$

$$A5_3 = 5_1 \qquad c(5) = 0 \qquad \Rightarrow c_2 = 0 \Rightarrow c_3 = 0$$

$$5_1, 5_2, 5_3 \text{ are linearly independent}.$$

(b) 
$$\left(\underline{\mathbf{I}}_{n} - \mathbf{U}\mathbf{V}^{T}\right)^{-2} = \underline{\mathbf{I}}_{n} + \mathbf{U}\left(\underline{\mathbf{I}}_{m} - \mathbf{V}^{T}\mathbf{U}\right)^{-1}\mathbf{V}^{T}$$

Assume Im-VTV is invertible.

