

Problem 1, (4 points)

Given the basis

$$B = \left\{ \begin{bmatrix} 3 \\ -5 \end{bmatrix}, \begin{bmatrix} -4 \\ 6 \end{bmatrix} \right\}$$

(1) Find the coordinate vector  $[x]_B$  for  $x = \begin{bmatrix} -5 \\ 7 \end{bmatrix}$

(2) Find the vector  $x$  with the coordinate vector  $[x]_B = \begin{bmatrix} -5 \\ 7 \end{bmatrix}$

Problem 2: Find the basis of Row space of matrix A.

of nul(A)

and also the dimension

$$A = \begin{bmatrix} 2 & -1 & 1 & -6 & 8 \\ 1 & -2 & -4 & 3 & -2 \\ -7 & 8 & 10 & 3 & -10 \end{bmatrix}$$

Problem 3 : Quick Questions (3 points)

1) If there are a linearly independent set  $\{v_1, \dots, v_p\}$  in vector space  $V$ .  
then  $\dim V \geq p$ . True or False? Justify your answer

2) If  $A, B$  are row equivalent, then their row space are the same?  
True or False? (Hint consider the different row operations)

3) If  $A, B$  are row equivalent, then their column space are the same? True or False