

Practice Questions Lecture # 25

Question # 1

Find the bases for the space spanned by the vectors

$$\vec{v}_1 = (2, 1, 1, 4), \quad \vec{v}_2 = (1, 3, 4, 5) \quad \text{and} \quad \vec{v}_3 = (4, 1, 1, 3).$$

Question # 2

If A is a 4×7 matrix with a three-dimensional null space, then determine rank of A ?

Question # 3

If the matrix $A = \begin{bmatrix} 3 & 1 & 7 \\ 2 & 1 & 4 \\ 4 & 2 & 8 \end{bmatrix}$, then prove that $n = \text{rank}(A) + \dim(\text{Nul}(A))$; where ' n ' is the number of columns in A .

Question # 4

Let $A = \begin{bmatrix} 1 & -2 & -3 & 5 & 1 \\ 2 & 1 & 7 & -1 & 6 \\ 3 & 5 & 7 & 9 & 1 \\ 4 & 5 & -6 & 7 & 8 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 2 & 3 & 4 & 5 \\ 0 & 1 & 3 & 5 & 7 \\ 0 & 0 & 1 & 8 & -3 \\ 0 & 0 & 0 & 0 & 0 \end{bmatrix}$ are equivalent.

Determine $\text{rank}(A)$ and $\dim(\text{Nul}(A))$.