

Assignment 4

1. Verify whether the set of vectors S is a basis of R^3

(i) $S = \{(0, 1, 1), (1, 0, 1), (1, 1, 0)\}$

(ii) $S = \{(2, 1, 1), (1, 2, 1), (1, 1, 2)\}$

(iii) $S = \{(4, 3, 2), (2, 1, 4), (2, 3, -8)\}$

(iv) $S = \{(1, 1, 0), (1, 0, 1), (0, 1, 1)\}$

(v) $S = \{(1, 2, 1), (0, , 1, 0), (0, 0, 1)\}$

2. Find the basis and dimension of the subspace W of R^3 , where W is given below

(i) $W = \{(x, y, z) \in R^3 \mid x + y + z = 0\}$

(ii) $W = \{(x, y, z) \in R^3 \mid x + y - z = 0, 2x + y - z = 0\}$

(iii) $W = \{(x, y, z) \in R^3 \mid x + 2y + z = 0, 2x + y + 3z = 0\}$

3. Verify rank- nullity theorem of the matrix A where A is

(i) $A = \begin{pmatrix} 1 & 1 & 2 & 3 \\ 3 & 4 & -1 & 2 \\ -1 & -2 & 5 & 4 \end{pmatrix}$ (ii) $A = \begin{pmatrix} 1 & -2 & 3 \\ -2 & 4 & 6 \end{pmatrix}$