II. consider vectors in R^3 $u = (1,1,1)$, $v = (1,2,-3)$ and $w = (1,-4,3)$ then which vectors are orthogonal.

XIV. If $A = \begin{bmatrix} i & 0 \\ 1 & -i \end{bmatrix}$, show that $A^4 = I_2$.

XV. If $A = \begin{bmatrix} 1 & -1 \\ a & b \end{bmatrix}$, & $A^2 = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ find a & b.

I. Find x,y,z,t such that $\begin{bmatrix} x+y & 2z+t \\ x-y & z-t \end{bmatrix} = \begin{bmatrix} 3 & 7 \\ 1 & 5 \end{bmatrix}$

II. Define trace of a matrix

III. Show that matrix $A = \begin{bmatrix} 1 & 2 \\ 3 & -4 \end{bmatrix}$ is zero of $g(x) = x^2 + 3x - 10$

IV. Find inverse of $A = \begin{bmatrix} 2 & 3 \\ 4 & 5 \end{bmatrix}$

V. If A is symmetric then show that $(A^{-1})^T = (A^T)^{-1}$

VII. Normalize the vector $v = (1,2,4,5)$

VIII. Whether the vectors $u_1 = (1,2,-3)$, $u_2 = (1,-4,3)$, are orthogonal or not

IX. Consider the vector $u = (1,-5,3)$ and find $\|u\|_\infty$, $\|u\|_1$, $\|u\|_2$

Q.No.1 Find Eigen values and bases for Eigen spaces of $A = \begin{bmatrix} -2 & -1 \\ 5 & 2 \end{bmatrix}$

Q.No.2 If $A = \begin{bmatrix} 4 & 2 \\ 3 & -1 \end{bmatrix}$ then diagonalize that matrix

Q.No.3 Show that matrix $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ satisfy its characteristic equation

Q.No.4 Find Eigen values and corresponding Eigen vectors of $A = \begin{bmatrix} 1 & 2 \\ 3 & 2 \end{bmatrix}$

Q.No.5 Determine whether the vectors in R^4 are linear independent or linear dependent (1,3,-1,-4),(3,8,-5,7),(2,9,4,23).

Q.No.6 Determine whether (1,1,1,1),(1,2,3,2),(2,5,6,4),(2,6,8,5) form basis of R^4 . If not, find the dimension of the subspace they span.

Q.No.5 Apply the Gram Schmidt process to transform the basis vectors

$u_1 = (1,1,1)$, $u_2 = (0,1,1)$ and $u_3 = (0,0,1)$ into an orthogonal basis and then normalize the orthogonal basis vectors to obtain an orthonormal basis

VII. If A is invertible matrix and n is nonnegative integer then show that $(A^{n})^{-1} = (A^{-1}$

VIII. If A is invertible matrix then A^{T} is also invertible and $(A^{T})^{-1} = (A^{-1})^{T}$

IX. If B and C are both inverses of the matrix A, then B = C

Q.No.5 Apply the Gram-Schmidt process to find an orthogonal basis and then an orthonormal basis for the subspace U of R^4 spanned by

$$u_1 = (1,1,1,1),\ u_2 = (1,2,4,5),\ u_3 = (1,-3,-4,-2)$$

Q.No.4 Consider the vectors $u_1 = (1,2,1,3,2)$, $u_2 = (1,3,3,5,3)$, $u_3 = (3,8,7,13,8)$, $w_1 = (1,4,6,9,7)$, $w_2 = (5,13,13,25,19)$ in R^4, let U = span(u_i), w = span(w_i). Then show that U = W

Q.No.3 Determine whether the vector v = (3,3,-4) is a linear combination of x = (1,2,3), y = (2,3,7), z = (3,5,6)

Q.No.2 Let W be subspace of R^5 spanned by the vectors $u_1 = (1,2,-1,3)$, $u_2 = (2,4,1,-2)$, $u_3 = (3,6,3,-7)$, $u_4 = (1,2,-4,11)$, $u_5 = (2,4,-5,14)$. find basis and dimension of W

Q.No.1 Find the inverse of matrix $A = \begin{bmatrix} 1 & 1 & 1 \\ 0 & 1 & 2 \\ 1 & 2 & 4 \end{bmatrix}$

Q. No. 9 solve the system by Gauss elimination method

$$\begin{aligned} 3x_1 + x_2 - x_3 &= -4 \\ x_1 + x_2 - 2x_3 &= -4 \\ -x_1 + 2x_2 - x_3 &= 1 \end{aligned}$$