Question Bank

Linear Algebra I /Second Stage/Med.& Comm. Physics

1. Define a column vector **U** in R^n ?
2. Find the value of x,y that makes (x,3) and (2,x+y) equals?
3. To which vector space R^n does each vector belong? Use (3,-2,5,3i) , (3,2), (π, 2,-5 π)?
4. Prove that **K.0=0**?
5. Define an **nxm** linear system and then solve the following system of linear equations:

$$x_1 + 2x_2 + x_3 = 3$$
$$3x_1 - x_2 - 3x_3 = -1$$
$$2x_1 + 3x_2 + x_3 = 4$$

Hint:[Using augmented matrix form] ?

Answer the following questions?

(A) Define an $\boldsymbol{mxn}$ linear system

(B) write the following system of linear equations:

6. $x_1 + 2x_2 + x_3 = 3$

$3x_1 - x_2 - 3x_3 = -1$

$2x_1 + 3x_2 + x_3 = 4$

in **matrix form** and then **solved it**?

7. **(A)** Find **A** and the value of **x**, if A= $\begin{bmatrix} 4 & x+2 \\ 2x-3 & x+1 \end{bmatrix}$ is symmetric?

8. Let A= $\begin{pmatrix} 1 & 2 & 3 \\ -2 & 0 & 1 \\ 1 & 2 & -1 \end{pmatrix}$, and B= $\begin{pmatrix} 3 & -1 & 2 \\ 3 & 2 & -1 \\ 2 & 0 & 1 \end{pmatrix}$.

Then is $(AB)^T = B^T . A^T$?

9. Let $A = \begin{pmatrix} 1 & 0 & 2 \\ 2 & -1 & 3 \\ 4 & 1 & 8 \end{pmatrix}$, then **answer** the following?

(A) Is A has **an inverse**? **If it** is then **find it?**

(B) In **which type** the **matrix** A **? (c) Show** that $tra\,(A) = tra\,(A^T)$?

10.Let **A=** $\begin{pmatrix} \mathbf{1} & \mathbf{2} & \mathbf{3} \\ \mathbf{-2} & \mathbf{0} & \mathbf{1} \\ \mathbf{1} & \mathbf{2} & \mathbf{-1} \end{pmatrix}$, and **B=** $\begin{pmatrix} \mathbf{3} & \mathbf{-1} & \mathbf{2} \\ \mathbf{3} & \mathbf{2} & \mathbf{-1} \\ \mathbf{2} & \mathbf{0} & \mathbf{1} \end{pmatrix}$.Then find $\mathbf{AB + B^T - 3A}$ **?**