# Lecture-5

$R^TR$ is always Symmetric.

$(R^TR)^T = R^T(R^T)^T = R^TR$ //

## Vector Space

→ Collection of Vector or Space of Vector but not just a bunch of Vector.

Rule for being Vector Space

⇒ We must be able to do any Linear Combination of Vectors in Vector Space without going out of it.

Example $R^2$ ⇒ All 2-Dn real Vectors

$R^3$ ⇒ All 3-Dn real Vector

$R^n$ ⇒ All n-dimentional real Vector

**Subspace** ⇒ A subspace is a Subset of Vector Space that Satifies the rules of Vector Space.

(ie $cV+V$ in subspace
$cV$ in subspace)

# All Subspace of $R^2$

⇒ all of $R^2$

⇒ Any line passing through $\begin{bmatrix}0\\0\end{bmatrix}$ L

⇒ Zero Vector only Z

If

⇒

⇒

#