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Level :200

1i)If one **vector** is equal to the sum of scalar multiples of other **vectors**, it is said to be a **linear combination** of the other **vectors**
ii)In the theory of **vector** spaces, a set of **vectors** is said to be **linearly dependent** if at least one of the **vectors** in the set can be defined as a **linear** combination of the others; if no **vector** in the set can be written in this way, then the **vectors** are said to be **linearly** independent

3)A *real vector space* is a set X with a special element 0, and three operations:

- Addition: Given two elements x, y in X, one can form the sum x+y, which is also an element of X.
- Inverse: Given an element x in X, one can form the inverse -x, which is also an element of X.
- Scalar multiplication: Given an element x in X and a real number c, one can form the product cx, which is also an element of X.

These operations must satisfy the following axioms:

- Additive axioms. For every x,y,z in X, we have
  - $x+y = y+x$.
  - $(x+y)+z = x+(y+z)$.
  - $0+x = x+0 = x$.
  - $(-x) + x = x + (-x) = 0$.
- Multiplicative axioms. For every x in X and real numbers c,d, we have
  - $0x = 0$
  - $1x = x$
  - $(cd)x = c(dx)$

- Distributive axioms. For every x,y in X and real numbers c,d, we have
  - $c(x+y) = cx + cy$.
  - $(c+d)x = cx + dx$.