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1. Linear Combination Of Vectors

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 for examples Suppose $a = 2b + 3c$, Thus, a is a linear Combination Of b and c

ii Linear dependence Of Vectors

In the theory of Vectors spaces, a set of Vectors is said to be linearly combination of ~~b and~~ the other's

2. $\alpha u + \beta v + \gamma w = (a, b, c)$

$$\alpha \begin{bmatrix} 1 \\ 0 \\ -1 \end{bmatrix} + \beta \begin{bmatrix} 2 \\ 1 \\ 3 \end{bmatrix} + \gamma \begin{bmatrix} 1 \\ 1 \\ -4 \end{bmatrix} = \begin{bmatrix} a \\ b \\ c \end{bmatrix}$$

$\alpha + 2\beta + \gamma = a$ — (i)

$0 + \beta + \gamma = b$ — (ii)

$-\alpha + 3\beta + -4\gamma = c$ — (iii)

$\beta + \gamma = b$

$\beta = b - \gamma$ — (4)

$\alpha + 2(b - \gamma) + \gamma = a$

$\alpha + 2b - 2\gamma + \gamma = a$

$\alpha + 2b - 3\gamma = a$

$\alpha - 3\gamma = a - 2b$ — ⑤

$-\alpha + 3(b - \gamma) - 4\alpha = c$

$-\alpha + 3b - 7\gamma = c$

$-\alpha - 7\gamma = c - 3b$ — ⑥

3) State 4 axioms of a Vector space.

additive axioms

multiplicative axioms

Distributive axioms