Ex:-4 $S = \{(x_1, x_2, x_3) \in \mathbb{R}^3 : x_1 + x_2 + x_3 \geq 0\}$

$u = (x_1, x_2, x_3)$

$v = (y_1, y_2, y_3)$

$u + v = (x_1 + y_1, x_2 + y_2, x_3 + y_3)$,

$(x_1 + y_1) + (x_2 + y_2) + (x_3 + y_3) \geq 0$.

$\alpha u = \alpha(x_1 + x_2 + x_3)$

let α -ve

$\alpha x_1 + \alpha x_2 + \alpha x_3 < 0$.

$\therefore$ S is not a subspace.

Dt:- 20.01.2020

Linear combination of Vectors :-

Let $u_1, u_2, \ldots, u_n$ are n-vectors in a vectorspace V and $\alpha_1, \alpha_2, \ldots, \alpha_n$ are scalars, then

$\alpha_1 u_1 + \alpha_2 u_2 + \ldots + \alpha_n u_n$ is known as the linear combination of $u_1, u_2, \ldots, u_n$.

$\alpha_1 u_1 + \alpha_2 u_2 + \ldots + \alpha_n u_n = 0$ is known as the trivial linear combination.

↳ If in the trivial linear combination of $u_1, u_2, \ldots, u_n$ all scalars $\alpha_1, \ldots, \alpha_n$ are zero, then $u_1, u_2, \ldots, u_n$ are known as linearly independent otherwise vectors are ld