

$$|A| = 2(0-3) - 0 + 0$$

$$|A| = -6$$

V_1, V_2 and V_3 are independent.

V_1, V_2 and V_3 span in R_3 .

Linear Independence

If $S = \{V_1, V_2, \dots, V_n\}$ is a nonempty set of vectors then the vector equations

$$K_1V_1 + K_2V_2 + \dots + K_nV_n = 0$$

has at least one solution

$$K_1 = 0, K_2 = 0, \dots, K_n = 0$$

If this is the only solution then S is called a linearly independent set. If there are other solutions then S is called a linearly dependent set.

Example If $V_1 = (2, -1, 0, 3)$, $V_2 = (1, 2, 5, -1)$ and $V_3 = (7, -1, 5, 8)$

Solution

$$K_1V_1 + K_2V_2 + K_3V_3 = 0$$

$$K_1(2, -1, 0, 3) + K_2(1, 2, 5, -1) + K_3(7, -1, 5, 8) = 0$$