

$\therefore B$ generates V .

i.e. $[B] = V$.

$\therefore B$ is a basis.

Q:- Check that $\{(1,1,1), (1,2,3), (1,0,0)\}$ is basis or not.

* $P_n(x)$

Standard basis for $P_n(x)$, $B = \{1, x, x^2, \dots, x^n\}$

test

* Dimension of a vector space V :-

The no. of elements in a basis of a v.s. V is called the dimension of V .

Ex:- Set of matrices of order 2×3

$$\begin{bmatrix} a & b & c \\ d & e & f \end{bmatrix}$$

$$\left\{ \begin{pmatrix} 1 & 0 & 0 \\ 0 & 0 & 0 \end{pmatrix}, \begin{pmatrix} 0 & 1 & 0 \\ 0 & 0 & 0 \end{pmatrix}, \begin{pmatrix} 0 & 0 & 1 \\ 0 & 0 & 0 \end{pmatrix}, \begin{pmatrix} 0 & 0 & 0 \\ 1 & 0 & 0 \end{pmatrix}, \begin{pmatrix} 0 & 0 & 0 \\ 0 & 1 & 0 \end{pmatrix}, \begin{pmatrix} 0 & 0 & 0 \\ 0 & 0 & 1 \end{pmatrix} \right\}$$

* Check that $\left\{ \begin{pmatrix} 1 & 0 & 1 \\ 1 & -1 & 1 \end{pmatrix}, \begin{pmatrix} 2 & 3 & 4 \\ -2 & 1 & 4 \end{pmatrix} \right\}$ is LI or not.

$$\begin{pmatrix} 1 & 0 & 1 & 1 & -1 & 1 \\ 2 & 3 & 4 & -2 & 1 & 4 \end{pmatrix} \text{ Find the rank.}$$

$$r < 2 \rightarrow \text{LD.}$$