Vector space:

V is said to be vector space if the following

properties are satisfied.

Let 4, 142, 42, 44 EV then,

(i) $\vec{u}_1 + \vec{u}_2 = \vec{u}_3 + \vec{u}_4$

(ii) $\vec{u_1} + (\vec{u_2} + \vec{u_3}) = (\vec{u_1} + \vec{u_2}) + \vec{u_3}$

(iii) $\vec{u}_1 + \vec{D} = \vec{u}_1 = \vec{D} + \vec{u}_1$

(iv) $\vec{u}_1 + (-\vec{u}_1) = 0 = (-\vec{u}_1) + \vec{u}_1$

*) Scalar multiplication:

Alf cui ev

1) $C_{1}(\vec{u_{1}} + \vec{u_{2}}) = C_{1}\vec{u_{1}} + C_{2}\vec{u_{2}}$ 11) $(\vec{c_{1}} + C_{2})\vec{u_{1}} = C_{1}\vec{u_{1}} + C_{1}\vec{u_{2}}$ 11) $(c_{1}c_{2})\vec{u_{1}} = C_{1}(c_{2}\vec{u_{2}})$ 10) $(c_{1}c_{2})\vec{u_{1}} = \vec{u_{1}}$

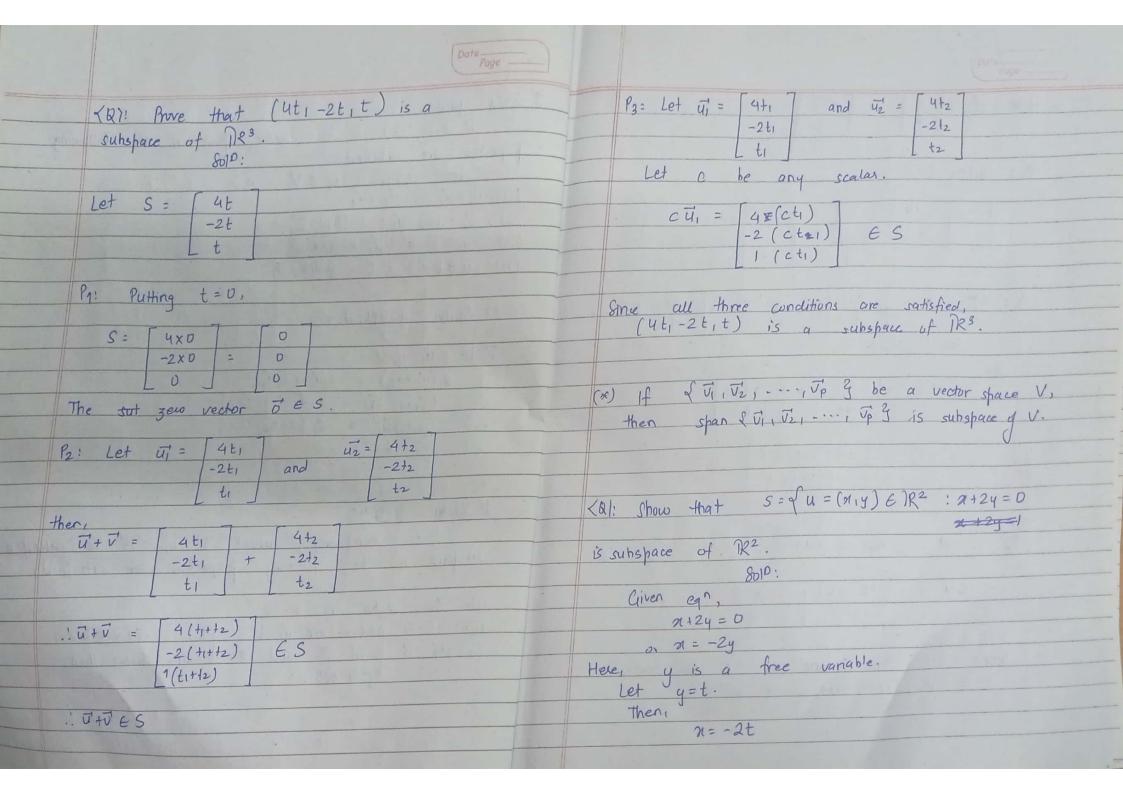
Vector subspace

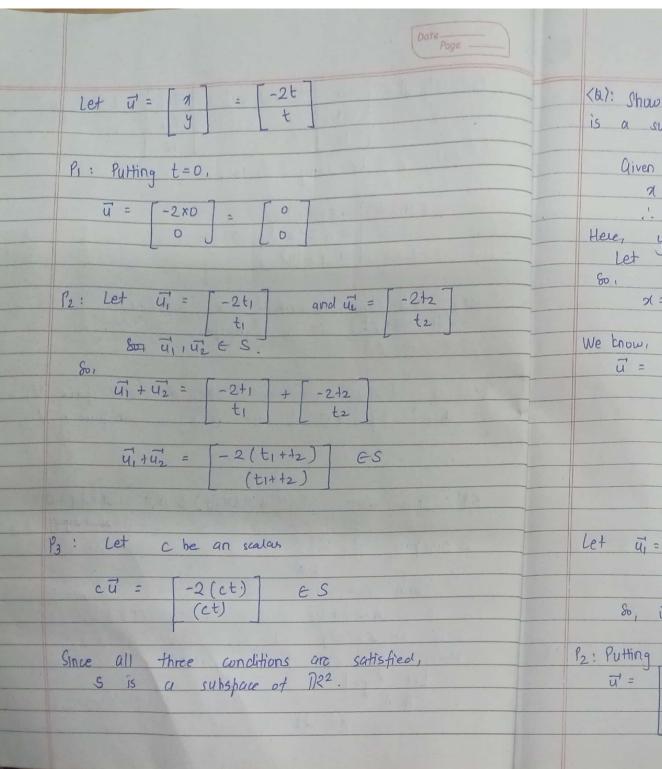
A non-empty subset 's' of 7R" is ealled a subspace if the following properties are satisfied.

(i): Zero vector is in 's'

(ii): If i and I are in 'S', then It VES.

(iii) If ii is in 'S' and ec be any sular then,





(b): Show that s= of u=(n,y,z) e 1R3, x-2y+3z=03 is a subspace of \mathbb{R}^3 . Solp. Qiven eq0, $\alpha - 2y + 3z = 0$ $\alpha - 2y - 3z$. Here, y and 2 are free variables. Let y=s and z=t. 80, x = 2s - 3t. $\vec{u} = \begin{bmatrix} n \\ y \end{bmatrix} = \begin{bmatrix} 2s - 3t \\ s \\ t \end{bmatrix}$

= S [2 + t [-3] | 0 | 1 |

Let $\vec{u_1} = \begin{bmatrix} 2 \\ 1 \end{bmatrix}$ and $\vec{u_2} = \begin{bmatrix} -3 \\ 0 \\ 1 \end{bmatrix}$

80, v = svi+tv2 es -

 P_2 : Putting S=0 and t=0, $\overrightarrow{u} = \begin{bmatrix} 2 \times 0 - 3 \times 0 \\ 0 \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \end{bmatrix}$

