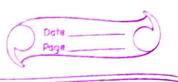


According to the question $ut \quad a = (1,0,1,0,...) \in W$ $b = (0,1,0,1,...) \in W$ So, a+b=(1,1,1,1,...) & W Le Wisn't a subspace of V. let a = (x, x2, 0,0,0...) EW b = (x, x2, x3, 0,0,...) EW So, da= (dr, anz, 0,0,0) E W Qa+b= (2x, 2x2, x3,0,0,0,...) EW So, Wis a subspace of V. a=(-3, 2, 1, 0, -1, -2, ...) EW b=(4,3,2,1,0,-1,-2,--) EW -da=(-d3,-d2,-d,0, x,2x,) € W So, it is not a subspace of V.

(d) let a be a member of this set, such that l(x) = lim x; exist, for E>0 there exist & len - nj < E Now for constant of, H d=0 dn = (0,0,...), converges to limit 0. lise if $d \neq 0$, Icen = lim cnj exist and tory under scalar multiplication.



Now for addition,

l(n+y) = lim nj + yj exiets, and

converges to lins & leys.

So, it is also closed under rector addition

Henre, it is a subspace of V.

M= (M, M2, M3, .-.) 6 W

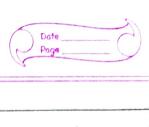
y= (y1, y2, y3, -) EN dr= ldn, dnz, dnz, dnz, dnz,

also in A.P.

Many = (x, ty, x, ty), we know adding two AP, also gives an AP.

So, nry & W

Henre, Wis a enbepare of V.



n=1,2,4,8.) fon, n,=1 & K=2

y=(1,3,9,27,-) ba 1,=1, k=3.

Mow, n+ y = (3, 5, 13, 35,...)

As per GP, third element them should be

(2.5)² × 2 = 12.5 instead of 13.

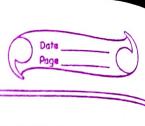
Hence, n +y & W.

So, it is not a subspace of V:

(a) Here nules 7 and 8 are broken.

(b) Here all eight rules are satisfied so it is a vector space under the vector addition and scalar multiplication operations defined above, with I as the zero vector

(c) Here, 1 and 2 miles are not gatisfied.



Here, $A = \begin{bmatrix} 1 & 1 & 1 \\ 1 & 0 & 2 \end{bmatrix} \begin{bmatrix} u_1 \\ u_2 \\ u_3 \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \end{bmatrix}$ y = 1

An = 0,

So, it forms, (b) a line (d) a subspace

(e) a nullspace

NR3 > R3 + R1

only if, $b_2-2b_1=0$ and $b_3+b_1=0$

The given given equation is solvable



in other words,

b vector
$$=$$

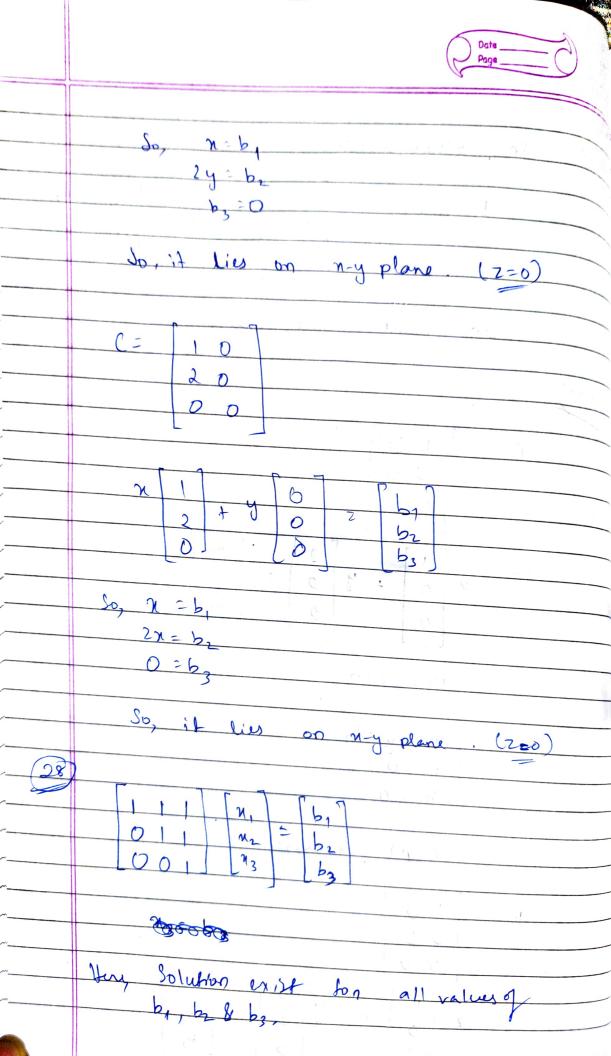
$$\begin{vmatrix} b_1 \\ 2b_1 \end{vmatrix} = \begin{vmatrix} b_1 \\ 2 \end{vmatrix}$$

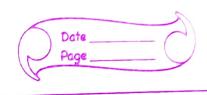
$$\begin{vmatrix} -b_1 \\ -b_2 \end{vmatrix} = \begin{vmatrix} 1 \\ 2 \\ -1 \end{vmatrix}$$

on right hand side.

So, $x = \begin{bmatrix} 1 \\ 0 \end{bmatrix} + \begin{bmatrix} 2 \\ 4 \end{bmatrix} = \begin{bmatrix} b_1 \\ b_2 \end{bmatrix}$ $\begin{bmatrix} 0 \\ 0 \end{bmatrix} = \begin{bmatrix} b_2 \\ b_3 \end{bmatrix}$ Here, z = 0,

Sb, C(R) = m - axis. $B = \begin{bmatrix} 1 & 0 \end{bmatrix}$





 7 (1-17	
1 1	1 M,	 91	
0 1 1	N2	b2	
12 10 0	1/2	b3	
000	L 13	 L	
_			

Hur, solution exists only if by=0.