## 20x-0274 NASHIT BUDHWANS

## Assignment #02. UA Date\_

En 401

(a) 
$$V = (0, 4) K = 2$$
  
 $V = (1, -3)$ 

$$U+V=(0,4)+(1,-3)=(0+141, 4-3+1)$$
  
=(2,2)  
 $KU=2(0,4)=(0,8)$ 

(b) 
$$U+0 \Rightarrow (0,0) + (U, \frac{1}{2}U_2)$$
  
=)  $(0+U, +1, 0+U, +1)$   
=)  $(U,+1, U, +1)$ 

(c) 
$$0+0=0$$
.  
 $(u_1, u_2) \pm (-1, -1) = u(7)$   
 $(u_1 + 1-1, u_2 + 1-1) \leq u$   
 $(u_1, u_2) = u$ 

$$(-U_1,-1,-1)$$
  
 $(-U_1,-1,-1)$   
 $(-U_1,-2,-U_2,-1)$  = -4

$$(v_1, v_2) = (-v_1 - 2, -v_2 - 2)$$

$$(v_1 - v_1 - 2+1, -v_2 + v_2 - 2+1)$$
  
 $(-1, -1) = 0$ 

(KU, )KU)+ (KV, )KU,)

(KU, +KV, +1), KU, +KU, +1)

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Aniom #8 (K+m)U=KU+me

(K+m) U = (K+m) U, (K+m) U2)

= (KU, + may KU, + m u)

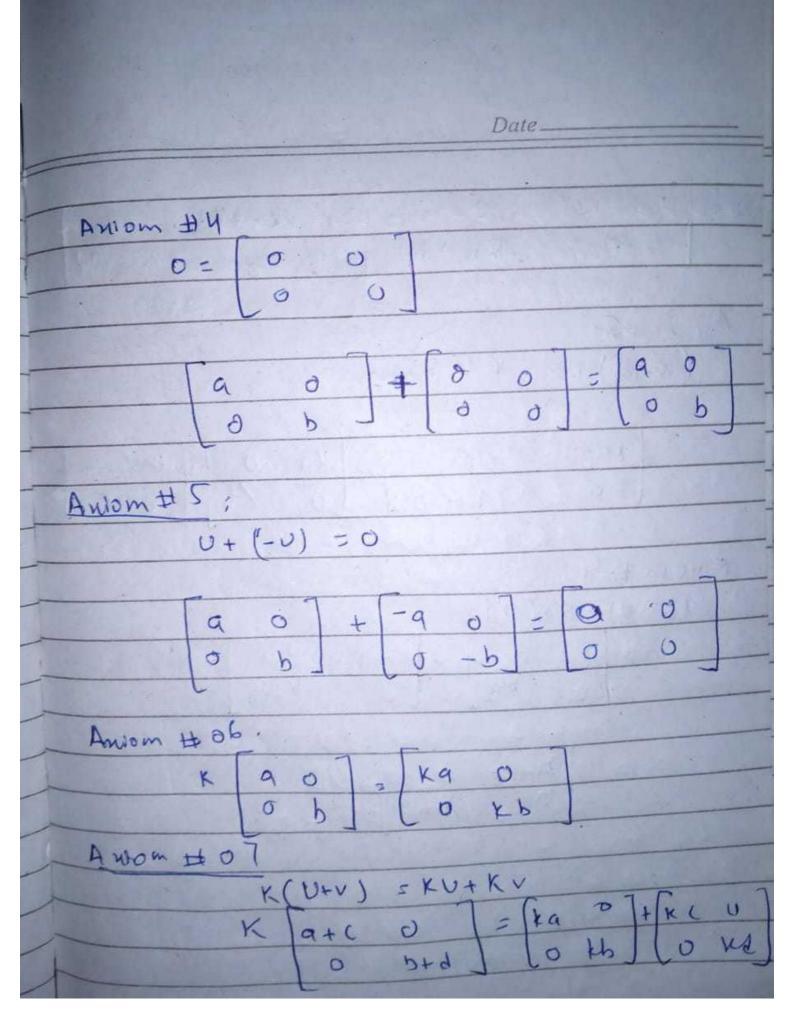
but ; KU+ mu

(KU, KU2) + (mU, mU2) (KU, + mU, +1, KU2 + mU2 +1)

Aniom 7 and 8 fail to hold.

Q4) [a o b

Autom 1 !



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-		All formations

ANIOM # 100 P

10=1

0 0 b

[a o ] = U

It is Vector

(It holds all Awams)

(1) U+V = (1, U+V); when v and V (1, X)

XU:= (1, XU)

Awom # 1:

(1,0) + (1,0) = (1,0+v)

Awom # 2

(1, v+v) = (1, v+v) (3, v+v) = (1, v+v) A 110m #07:

K(1, U+U) = (1, KU) + (1, KU) (1, KU+KU) = (1, KU+KU)

Autom # 9:

(1, (K+m)U) = KU+mU

(1, Ku+mu)

(1,xv)+(1,mv).

1

Ku + mu

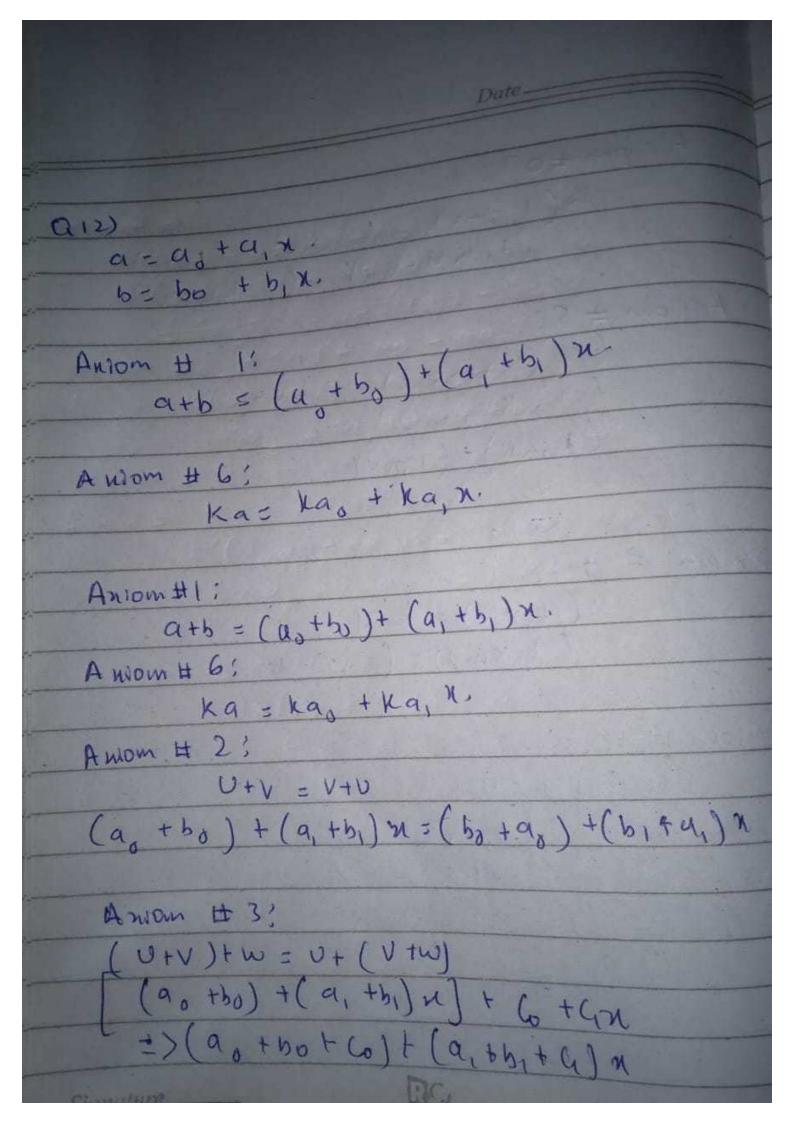
Amom H'q;

K(1, mu) = Km(v) (1, Kmv) = (1, 4mv)

Awom # 10 %

10:0

1(1,0)=0



Amon 440

0 = 0 + 0x.

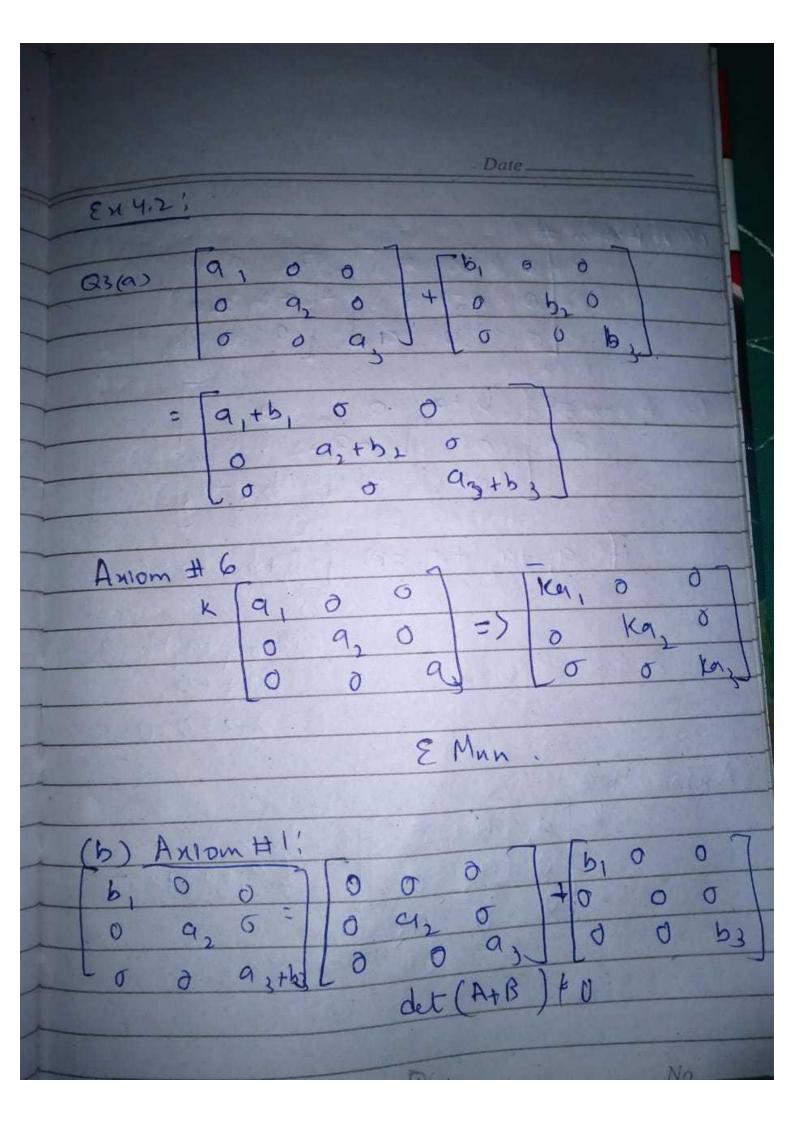
4+0 =9

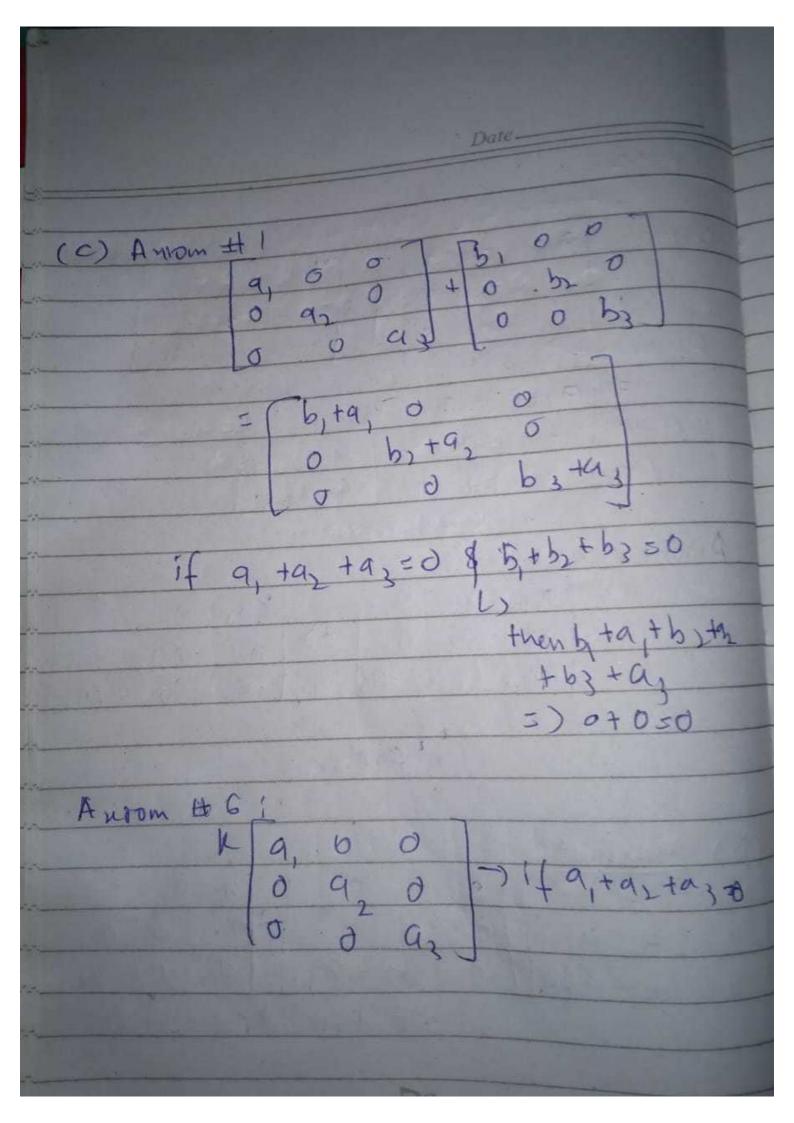
(a, +a, x) \* (0+0x) a, + (a1)x = a.

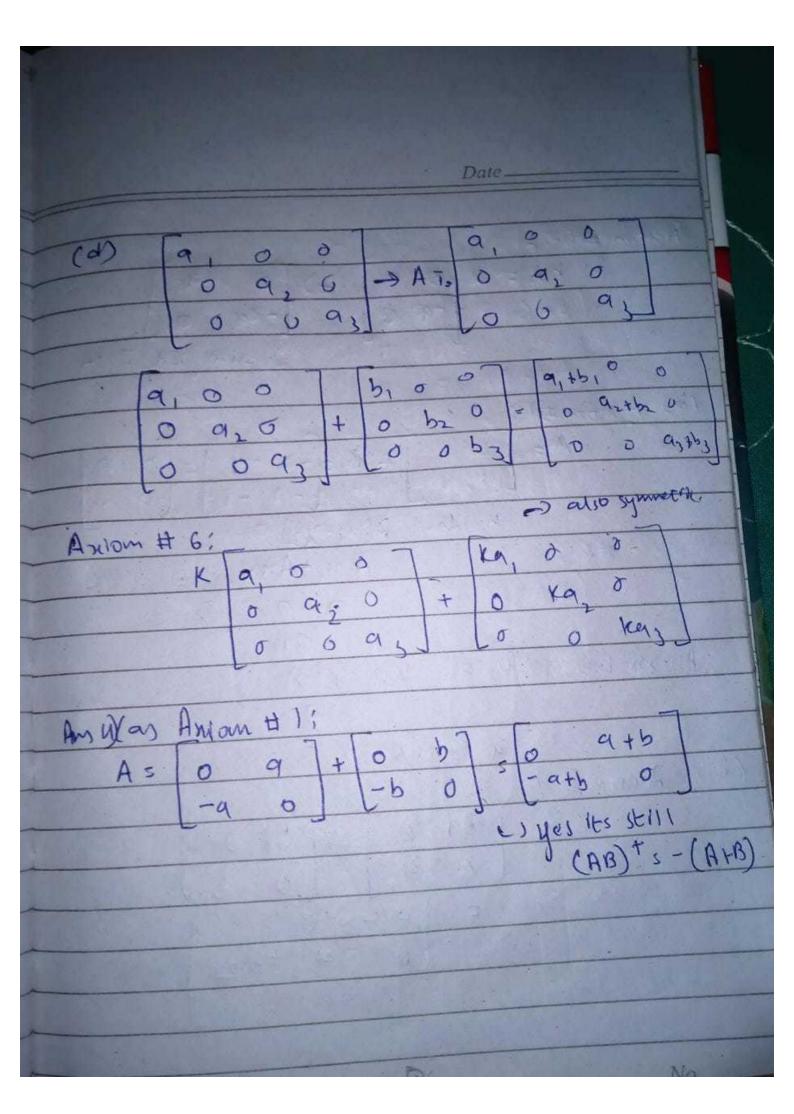
Andom # 05  $U+(-u) \leq 0$   $(a_0+a, u)+(-a_0-a, u)$   $O+0x \leq 0$ 

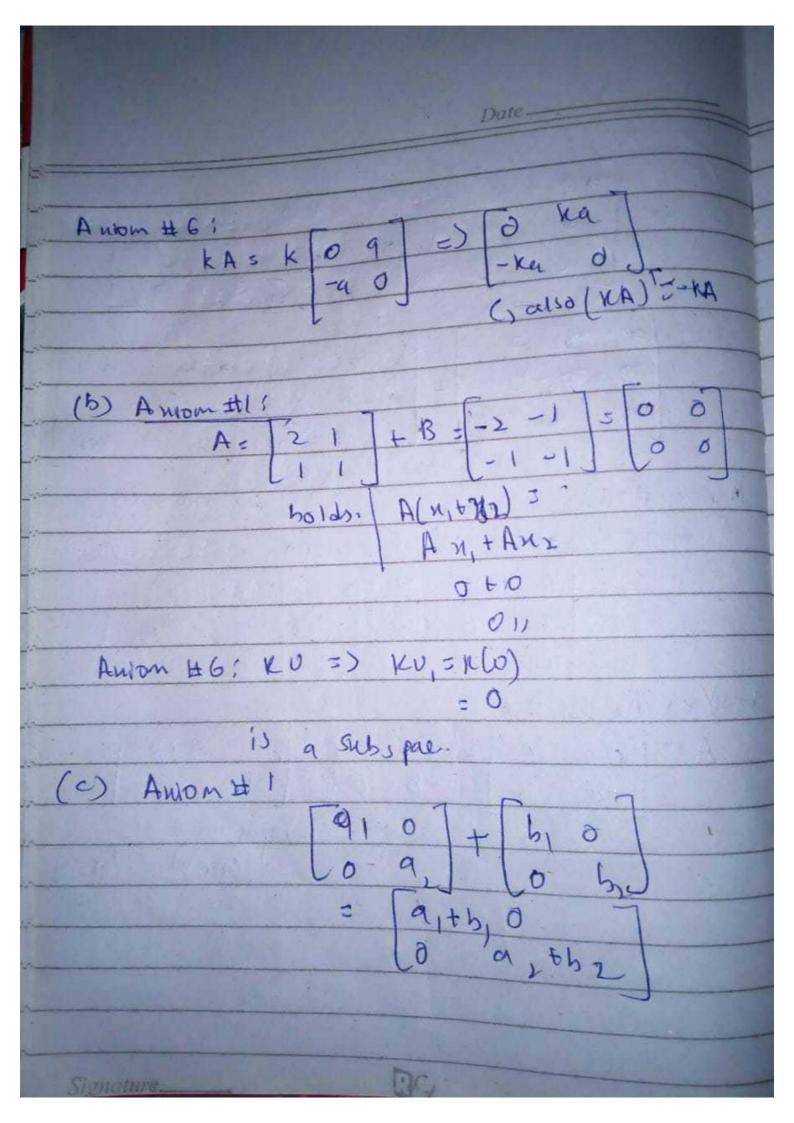
Amon # 7;  $K(a_0+b_0)+K(a_1+b_1)X$ ,  $(ka_0+kb_0)+(ka_1+kb_1)X$ .  $K(a_0+a_1X)+K(b_0+b_1X)$ .  $K(a_0+a_1X)+K(b_0+kb_1X)$ .  $K(a_0+ka_1X)+K(b_0+kb_1X)$ .  $(ka_0+kb_0)+(ka_1X+kb_1X)$ .

Anom #8: (K+m) U = KU+MU (K+m) (a, +a, x) ( Ka + Kbo ) + ( xa, x + Kb, x) Ka + Ka, X + ma + ma, X. K(a, +a, x) + m (a, +a, x) Ka, + Ka, x + ma, + ma, x K(ma, +ma, x); Km(a, +a, x) Awom # 9 Kina, +kma, x = Kma, x + kma, x. A worm # 10/ 1x( a, + a, x) = a? a + a, x 54

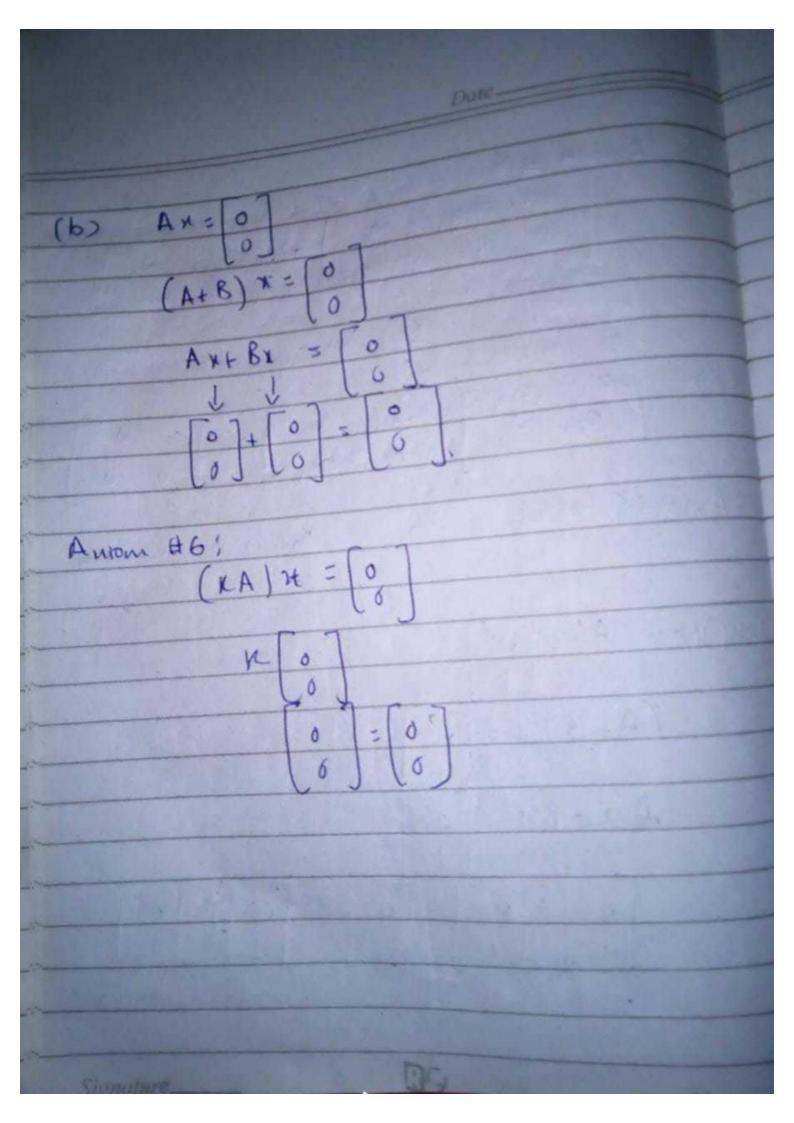








Date
Amom #6: x [a, o] =) [kg, o]  o ka]
It is a supspire.
(d) [a, a, 7+[-a, 0]=7[0, a, ] 0 92 + [0 - a, ]=7[0 0]
Amom I failed this is not invertise
Qy)(a) Ax= [0]
(A+B) x = 0
Ax+Bx=0
[0] + [0] = [0] [0] # [0]  2) * [0] = [0] [0]   * [0]



Q16) (a) A = 2+ 4n +6n2 B = 12 + 24 x +8x2.

A+B= 14 + 28x + 14x2

even. Amom # thoth

Axrom #06:

KASKZ + YK X + 6KXL Crey

- COEN

holds.

(5) A Mom # 11

A = 2+(-4x) + 2x2.

B=-8+6x+m2.

(A+B) =-6+m+4x2.

= -6+2+4 = 70

Anvon # 6

= 2x+ (-4x) x+ (2x)x1 = xx+ 2x-4x=36

No.

(c)  $A = a_1 + a_2 \times x + a_3 \times x^2$   $B = b_1 + b_2 \times x + b_3 \times x^2$ A+B= (a,+b,)+(b,+b2) N+(a3+b3) N2 Awon # 66: KA s Ka, + Ka, n + ka, Kh still even Ex 4.3; R\_-R\_=> As 1 1 0 -1 0 (-1 x R2 -> R2) => A = [1 1 Signature\_

$$(R, -R, -)R_1) = A = \begin{bmatrix} 1 & 0 & 1 & 0 \\ 0 & 1 & 0 & 1 \\ 0 & 0 & 0 & 0 \end{bmatrix}$$

N +Z=0

y+w=0 0=0

n = 5

2=-5

y=t

(x,y,z,w) = (s,t,-s,-t)

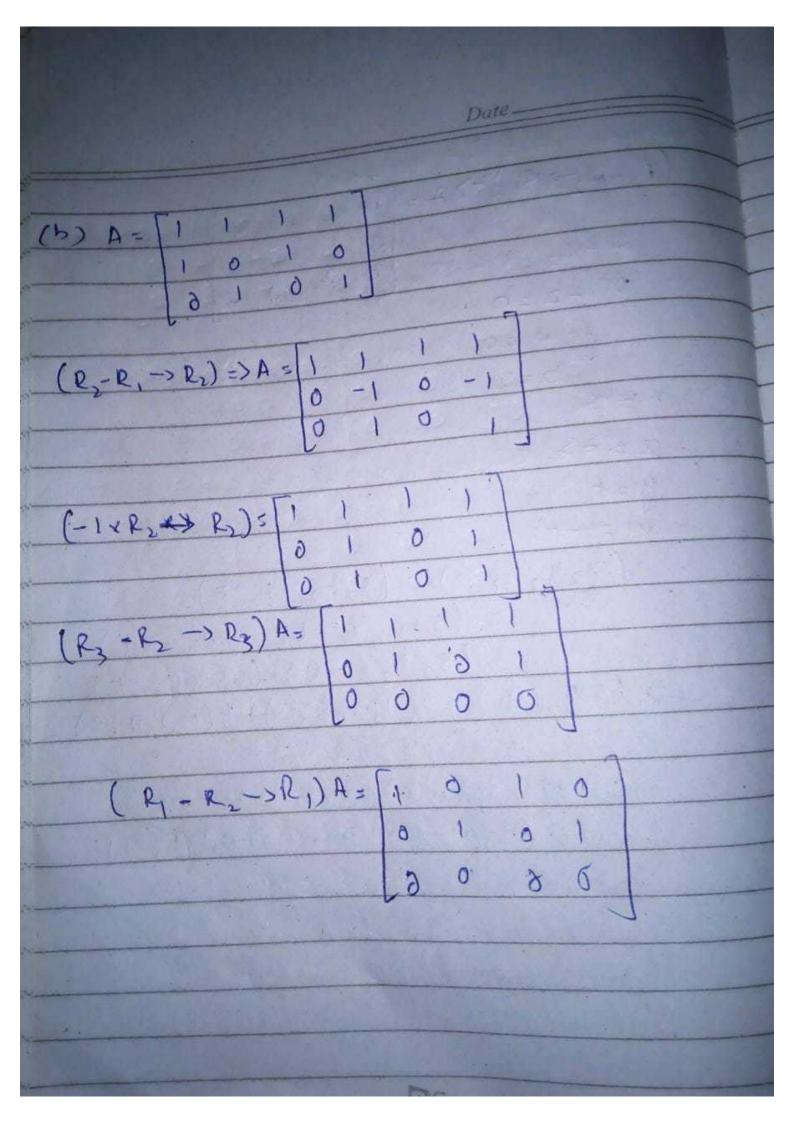
= (s+0,0+6,-S+0,0-t)

= (5,0,-5,0)+(0,t,0,-t)

=> (x,y, z,w) = S(1,0,-1,0)++(0,1,0,-1)

Solution space is spanned by well ors!

Us (1,0,-1,0) and V = (0,1,0,-1)



y = t w = -t

(x,y,z,w)=(s,t,-s,-t)

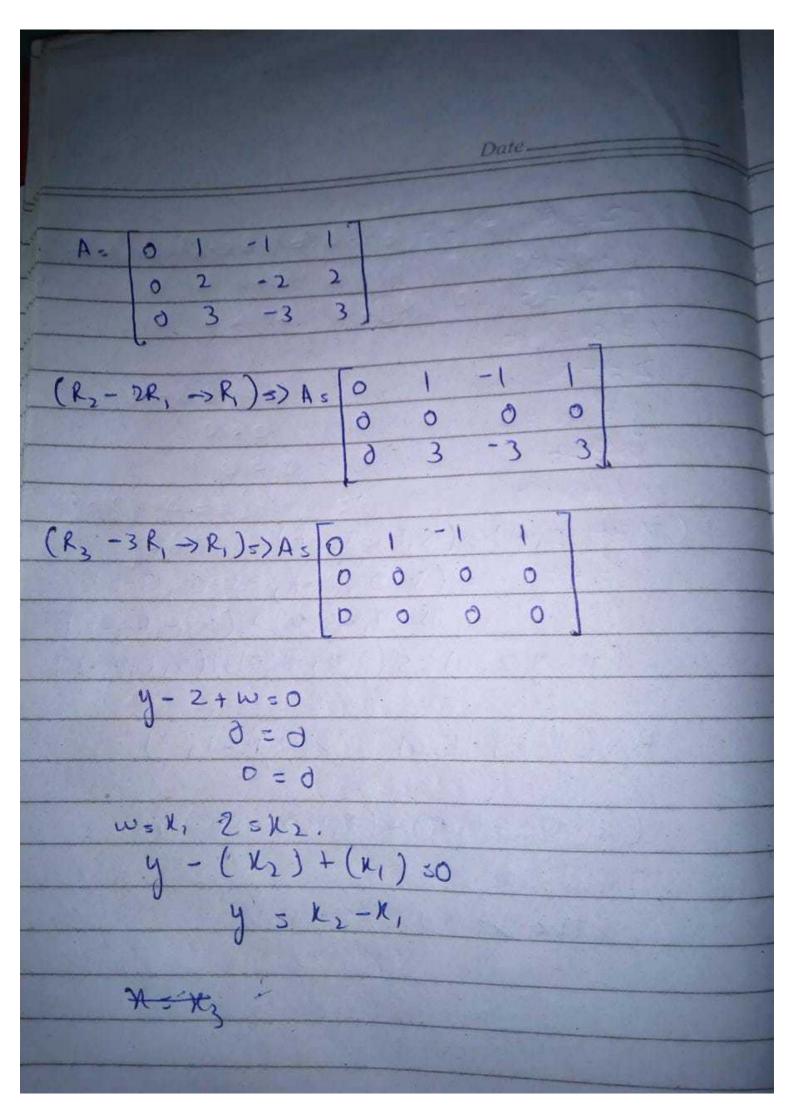
= (S+0,0+t,-S+0,0-t) = (S,0,-S,0)+(0,t,0,-t)

(21, 4, 2, w) = S(1,0,-1,0)+t(0,1,0,-1)

us(1,0,-1,0) V=(1,1,-1,-1)

(1,0,-1,0)+(0,1,0,-1) = a+b.

the set 30, v3 span W



$$(\pi, y, z, w) = (\kappa_3, \kappa_2 - \kappa_1, \kappa_2, \kappa_1)$$
  
=  $(\kappa_3, 0, 0, 0) + (0, -\kappa_1, 0, \kappa_1)$   
+  $(0, \kappa_2, \kappa_2, 0)$ 

 $(x_1y_1z_1w)=k_3(1,0,0,0)+k_1(0,-1,0,1)$ + $k_2(0,1,1,0)$ 

(x,y,z,w)=(1,1,1,0)+x,(0,-1,0,1)

} u, u } span & w

Ans 16 b) As	50	1	= 1	1
	10	2	- 2,	2
	10	3	- 3	3

$$(R_2 - 2R_1 - 7R_2) = > A = \begin{bmatrix} 0 & 1 & -1 & 1 \\ 0 & 0 & 0 & 0 \\ 6 & 3 & -3 & 3 \end{bmatrix}$$

(R3-3K,->R,)=>A= 0 y-2+w=0 W=K, Z=K2 y-(K2)+(K1)50 4= K1-K1 X= Kz (1,4,2W)=(K3,K2-K1,K2)K1) 3 (K, 10, 0,0)+(0,-1, 10, K)+ = (x, y, z, w) = (x(0,-1,0,1) + K, (0,1,170) wis not spanned by V

En #4.4 \$

Ans 11) 
$$a(\lambda, -\frac{1}{2}, -\frac{1}{2}) + b(-\frac{1}{2}, \lambda, -\frac{1}{2}) + (-\frac{1}{2}, \frac{1}{2}, \lambda) = 0$$

$$\frac{dt}{-1/2} \begin{bmatrix} \lambda & -1/2 \\ -1/2 & \lambda & -1/2 \\ -1/2 & -1/2 & \lambda \end{bmatrix} = \lambda \begin{bmatrix} \lambda & -1/2 \\ -1/2 & \lambda \end{bmatrix}$$

Di

No.

$$= \lambda \left( \lambda^{2} - \frac{1}{4} \right) + \frac{1}{2} \left( -\frac{2}{\lambda} - \frac{1}{4} \right) - \frac{1}{2} \left( \frac{1}{4} + \frac{\lambda}{2} \right)$$

$$= \lambda^{3} - \lambda - \frac{1}{\lambda} - \frac{1}{\lambda} - \frac{1}{\lambda} - \frac{1}{\lambda}$$

DC.

No

$$a(1,1,2)+b(3,-1,2)+c(3,-3,2)$$
  $(0,0,0)$   
 $a(1,1,2)+b(3,-1,2)+c(3,-3,2)$   
 $=(a,a,2a)+(3b,-2b)+(3c,-36,2c)$ 

(a +3b+3c ,a-b-3c, 2a+2b+24)

a+36+3c=0

a - b - 3 c = 0

2a + 2b + 2 CEO

$$a + 3b + 3c + a - b - 3c - (2a + 2b + 2c)$$

$$= 0 + 0 - 0$$

-20=0

C=0

9-650

a + 3550

2a + 2h = 0

· 9= b= C = 8

Linearly independent