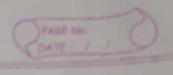
UE 13 MD 251 Linear Algebra and its Applications Assignment



O Find the Equation of the Purphola 4-A+Bx+Cx that Posses through 3 points (1,1), (2,1) and (3,1) using gaussian elimination

Passes through

(1,1) (2,-1) (3,1)

1 Ale hove A+B+C=1 A+2B+4C=-1 A+3B+9C=1

Augmented motive [A b] = [1 1 1 1]

12 4 1

13 9 1

Using gaussion Elimination.
Rot Ro-Ro

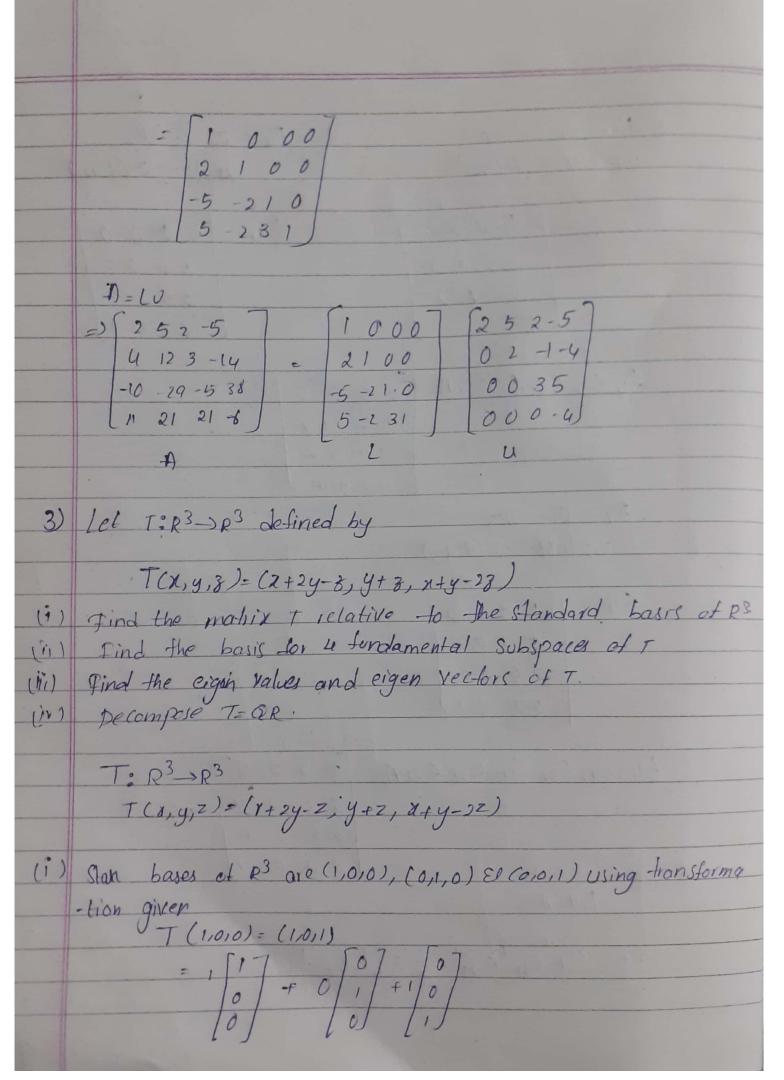
[1 1 1 1] [0 1 3 - 2] [0 2 8 0]

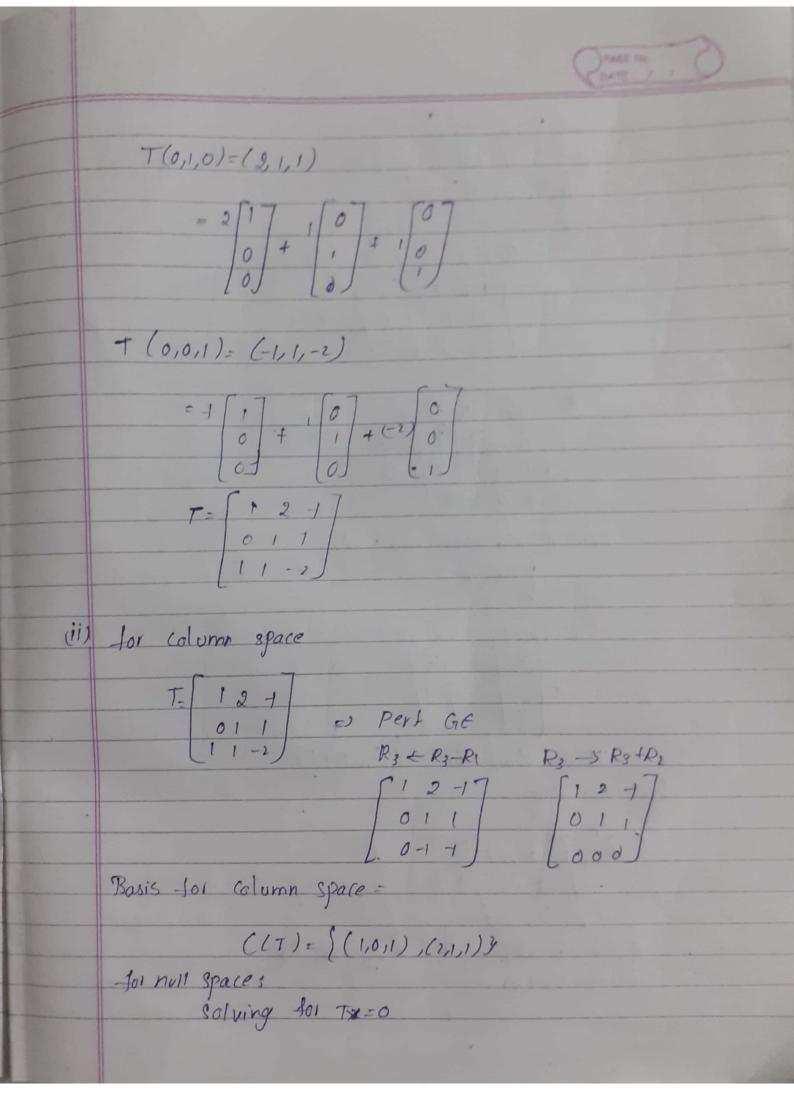
 $\begin{array}{ccc} 3 & 2C = 4 & 5C = 2 \\ B + 3C & 2 & -2 \\ B + 3(1) & = -2 \\ \hline B & = -8 \\ \hline A + B + C & = 1 \end{array}$

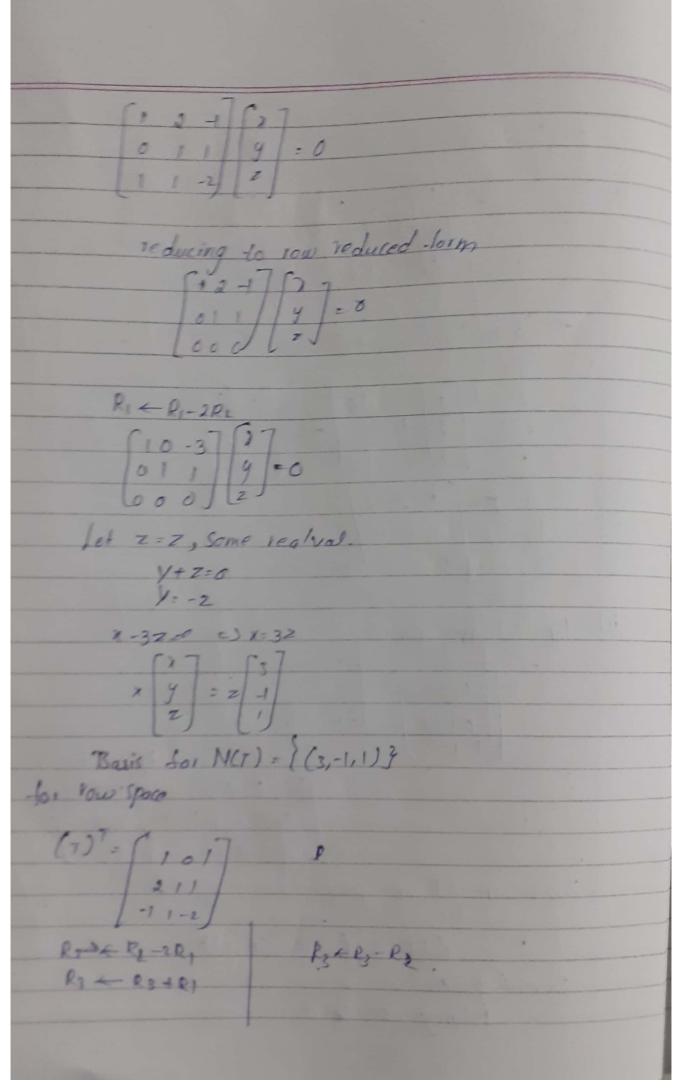
N-8 +2=1 A=F

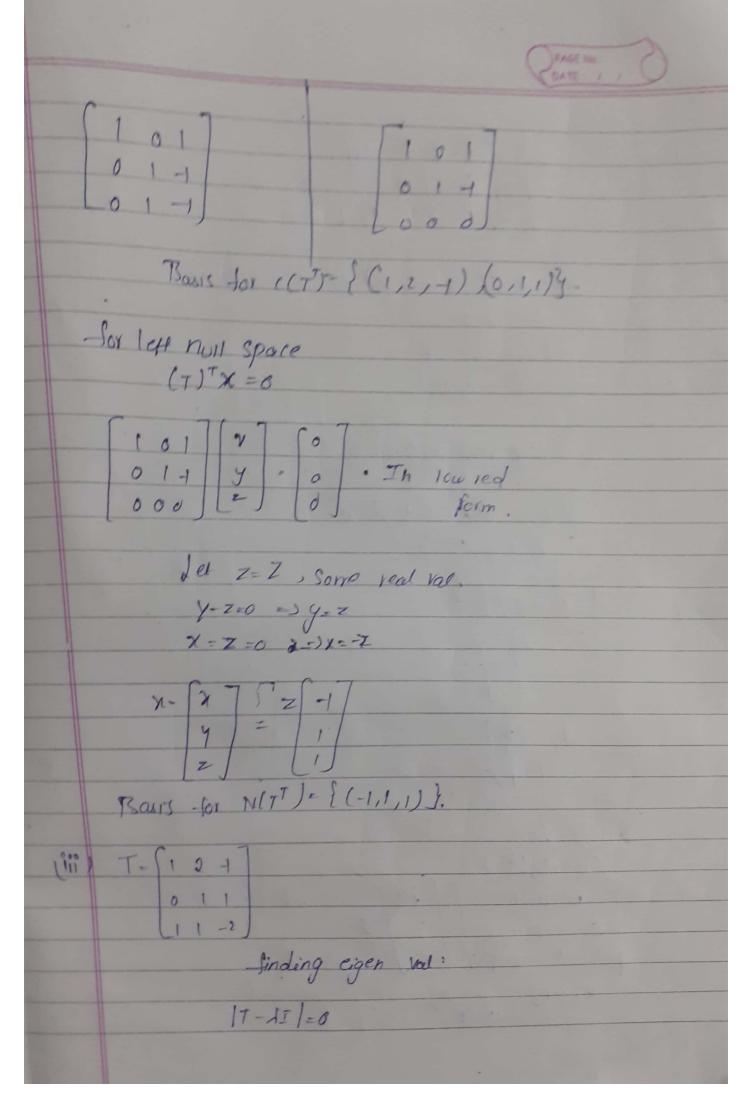
11.73	
	. 0 7 8 6 7-2
	: 10 = 7 B = -8 , C = 2. : eq of Parabola.
	y= 7-8x + 2x211
2)	Find the LU decomposition for the motion
	252-5
	A 4 12 3 -14 -10 -29 -5 38
	10 21 21 -6
	R> L R>-1R, [1000]
	multiplier = 2 (2) = -2 100 (121)
	[000]
	R3 L R3 - (-5)R1
	multiplies = -5 (3) 0100
	(C31) 5010
	[0001]
	Rut P Co
	Rux Ru-5R1 10007 Multiplies-5 Ey1 0100
	Multiplies-5 Eyi 0100
	(L41) 0010 -5001
	Eu E3 61 A= [2 5 2 -5]
	02-1-4
	0-4 5 13
	10-4 11 19

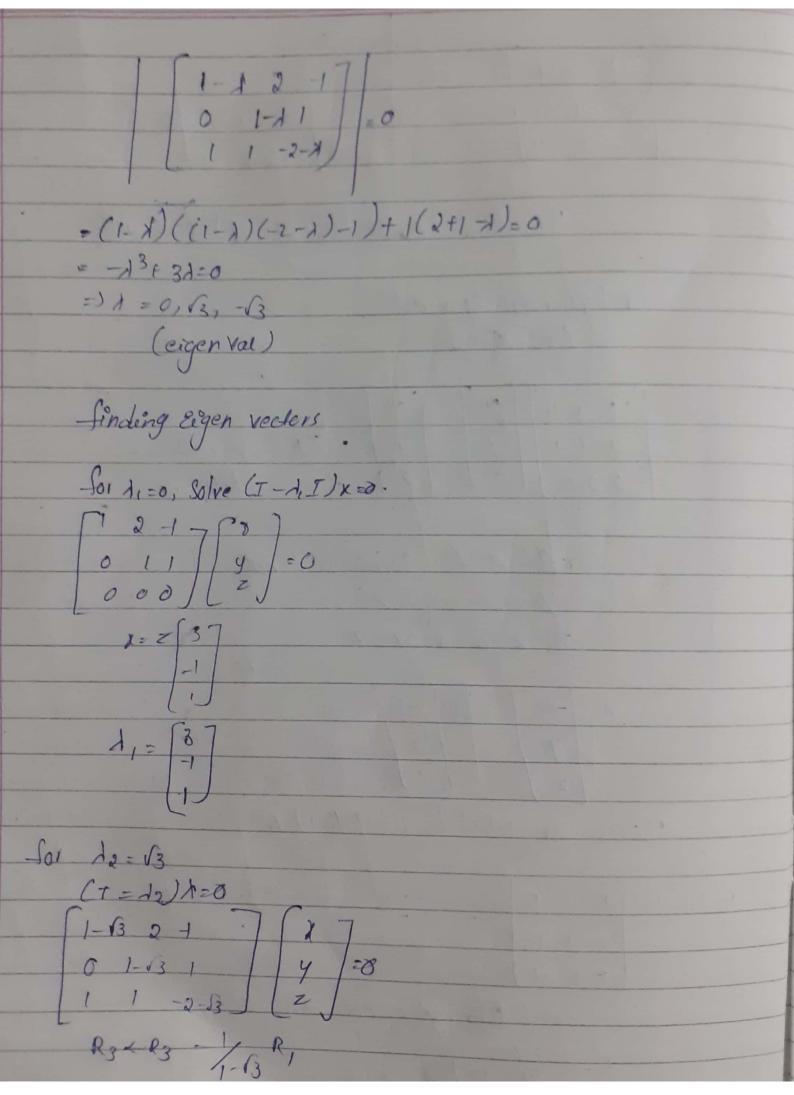
R3 L P3-(2) P3 Rut Ry-COPE MUH = - 2 (Cu) -Mult = -2(130) 6420 1000 632 10007 10100 0100 10010 60201 Ey£3, Cy1631621A= 252-5 0 2 -14 00 35 00911 Ry LRI - 3R3 · Multi-3 (Luz) E43= [1000 0100 0010 00 -31 252.5 E43E42E32 E41 E31 E21 A= 0035 000-4 LU = A => (= Ex) (3) (Ey) (3) (Eu) (Eg) ...

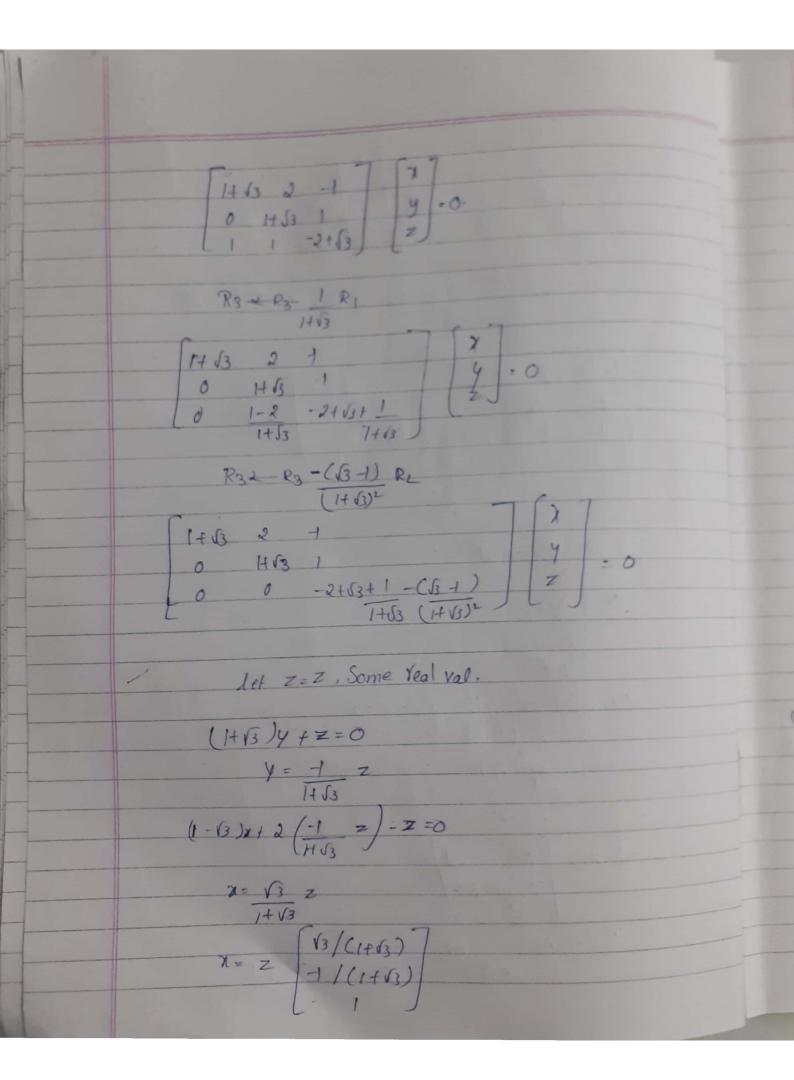


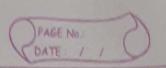












×3 =	V3/(1+1/3)		
	1/400		
	1 1		

Eigen Val au

X1 -1 . Y2 = -1/(1-13)

×3= [V3/(1+V3)]

We get the eigen vectors by rationalising the denominators

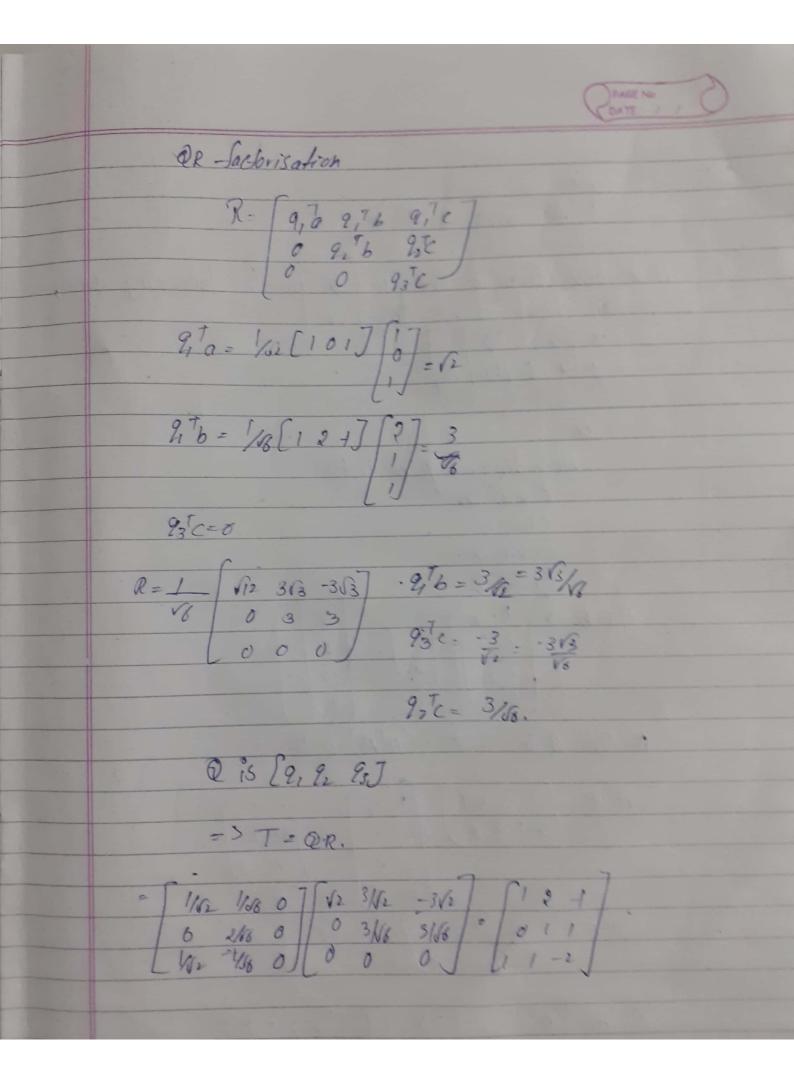
$$x_1 = \begin{bmatrix} 3 \\ 1 \end{bmatrix}, x_1 \begin{bmatrix} 13+3 \\ 2 \\ 1 \end{bmatrix}, x_3 = \begin{bmatrix} 3-\sqrt{3} \\ \frac{1-\sqrt{3}}{2} \\ 1 \end{bmatrix}$$

1=0 12=13 13=-63.

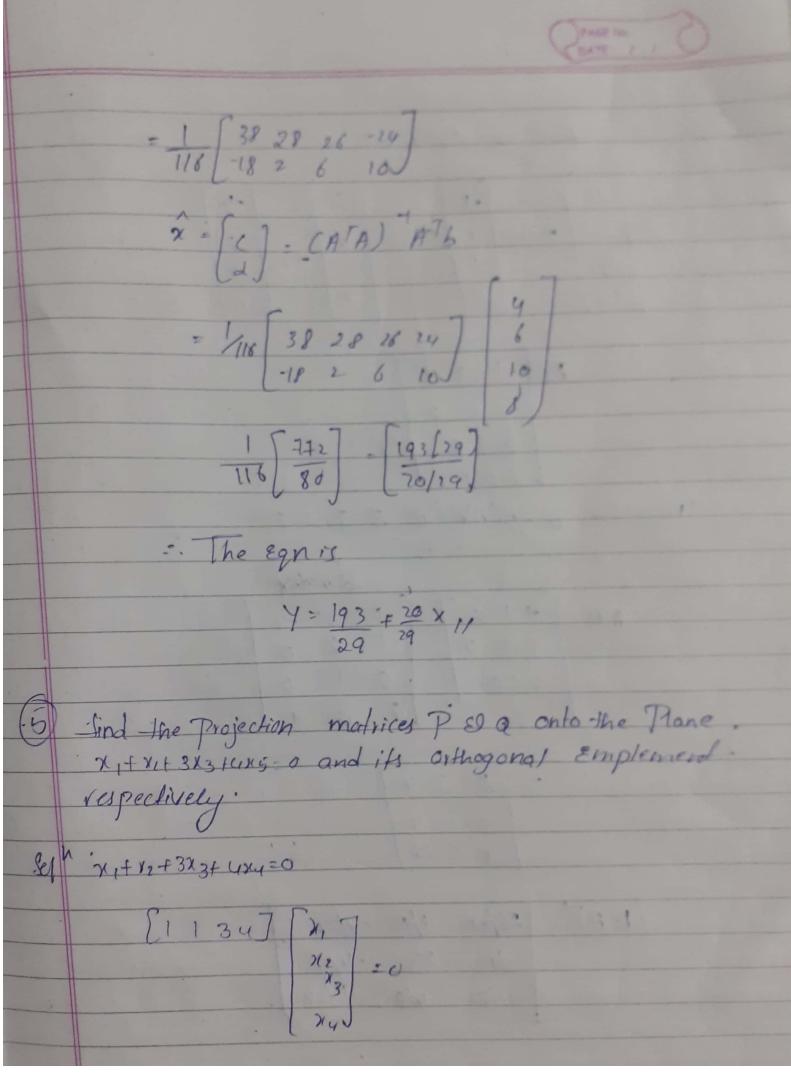
$$T = \begin{bmatrix} 1 & 2 & 4 \\ 0 & 1 & 1 \end{bmatrix} \qquad \begin{array}{c} a_1 & (1,0,1) \\ b_2 & (2,1,1) \\ 1 & 1 & 1 \end{array}$$

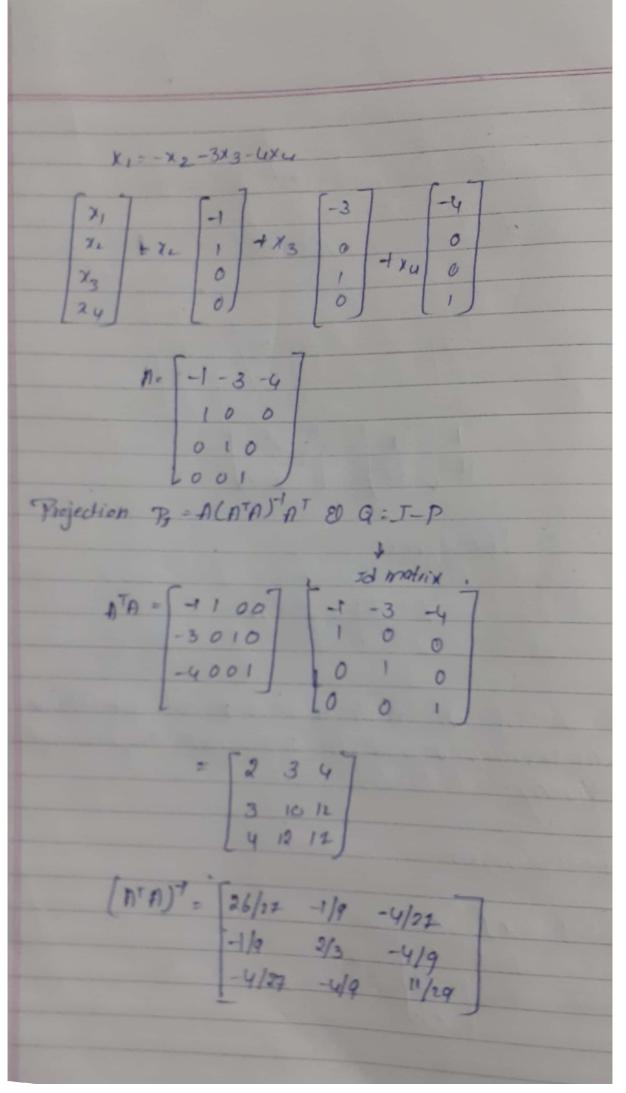
The Gram - Schmidt grocess.

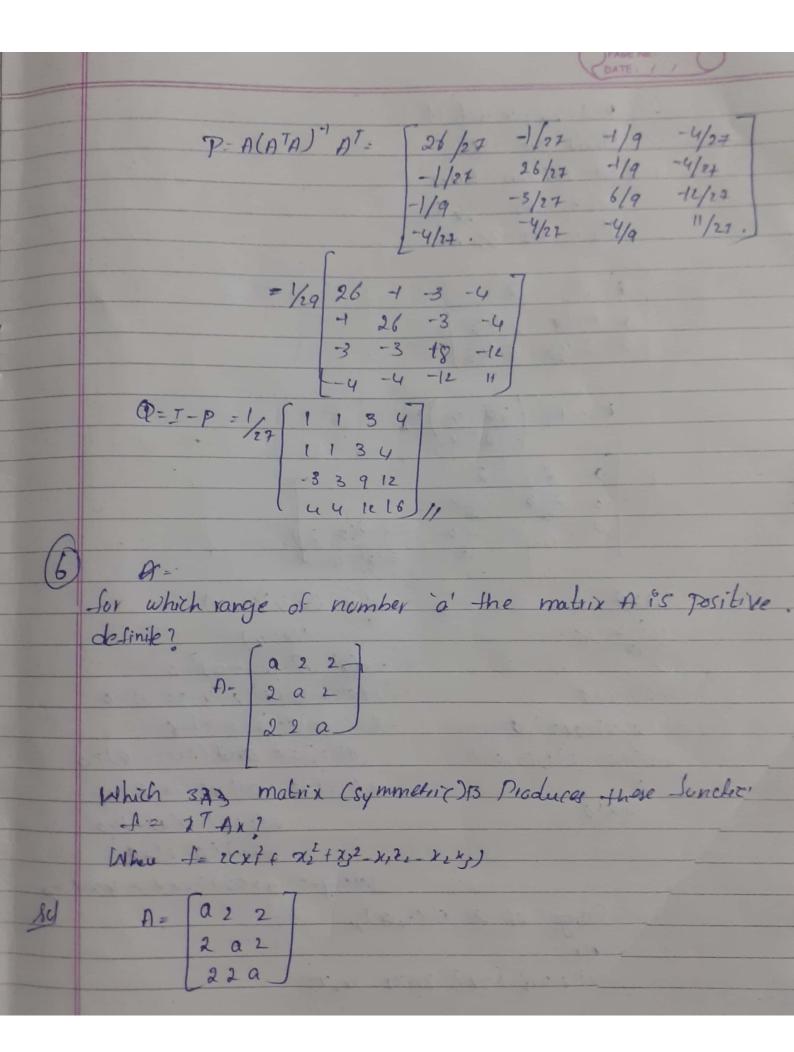
11911: 112102112 : 12



YE CLON · According to given using lest straight line ye code for the sollowing data. 1 4 1 1 2 8 1 8 1 S y=Ctabe. or According la gillen into Cud: 41 C-101 - 6 C1 2d=10 -Dx = b = 3 $\begin{cases} 1 - 4 \\ 1 \end{cases}$ $\begin{cases} 4 \\ 6 \end{cases}$ ATAX=ATB = X = (ATA) "DTB $A^{T}A = \begin{bmatrix} 1 & 1 & 1 & 1 \\ 4 & 1 & 2 & 3 \end{bmatrix} \begin{bmatrix} 1 & -4 \\ 1 & 2 \end{bmatrix} \cdot \begin{bmatrix} 4 & 2 \\ 0 & 3 & 0 \end{bmatrix}$ (PTP) = 1/18 / 50 -27







- Will be eve def it: · Pivots are tre red to Echelon form R2 + R2 - 2/a R1 R3 + R3 - 2/a R1 0 2-4/9 2-4/9 0 2-4/9 2-4/9 $R_3 \sim R_3 - \left(\frac{2q - 4}{a^2 - u}\right) R_1$ $\frac{1}{0}$ $\frac{2}{a^{2}}$ $\frac{2}{a}$ $\frac{2}{a}$ · a>6 - a-4 - (2a-4) (20-4).

- a (a24)
- (a24)² - (2a-4)² +0 - 02-4 20 2) 02-420 =) Ca2-4-2afa)(a2-4+2a-4) >0 = X(a2-2a) (a41a-8)26 =) (a-2)(a+2)>0 - 1 a2-20) > 0 and (a2+20-8)=0 =5(-0,-2)11(2,00) as as d a la-2) so alt 4a-2a-8 >0 a(a+4)-1(a+4)>0 (a+4) (a-21>0 : Ne get arovariva >-400> Trange of a 13 (2,0), f= xTAX f=2x1+2x1+2x32-2x,x1-2x2x3

Let Y= (X1, X2, X3) A = reg 3x3 motrix a13 a23 933 71 Ax - [x yz] [911 912 913 912 022 023 913 023 033 \$ TAX = [xyz] [a11 a12 a13] [7]
a12 a12 a23 [7]
a13 a13 a23 a33 = Qux2+ Q2342+ Q3322+ 2012xy+ 2013x2 + 202342 Comparing with i) (x=x1, y=x, z=x3) $=) a_{11} = 2 \quad a_{22} = 2 \quad a_{33} = 2$ $a_{12} = -1 \quad a_{13} = 0 \quad a_{23} = -1$ Reg 3x3 Symm-matrix= 2 +0 0 -1 2 Find the SUD of A, UZYTWhou

