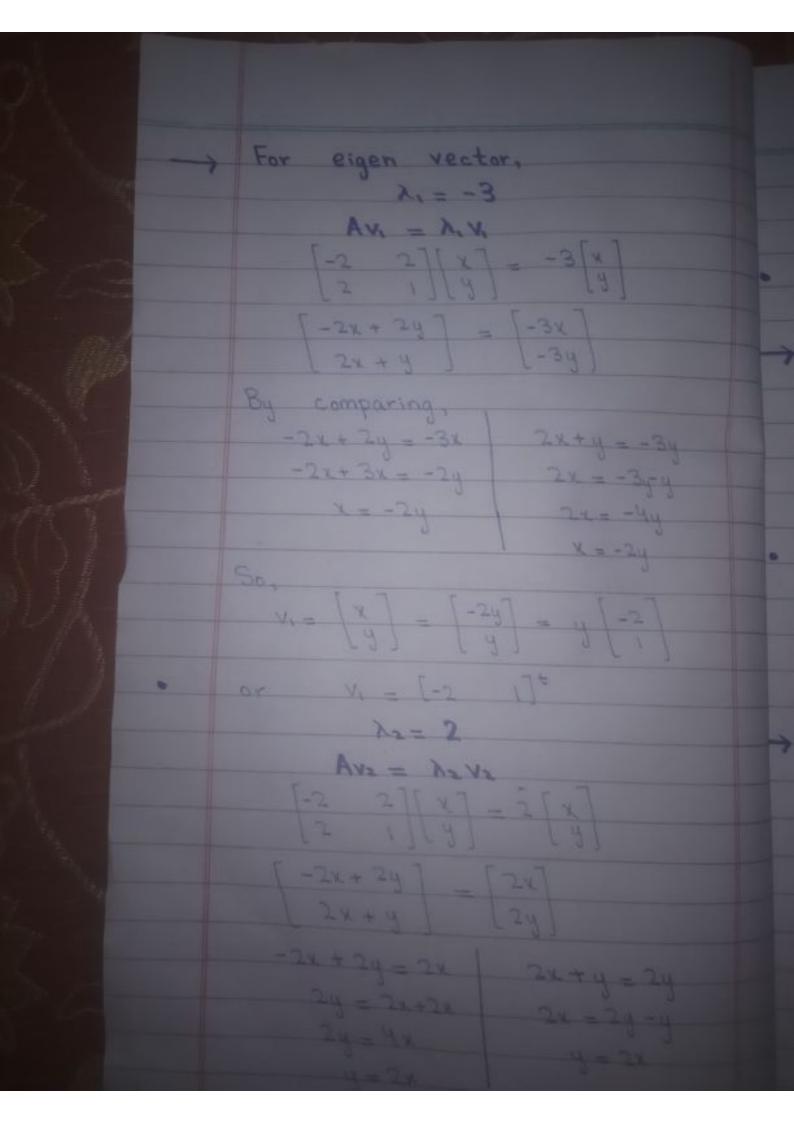
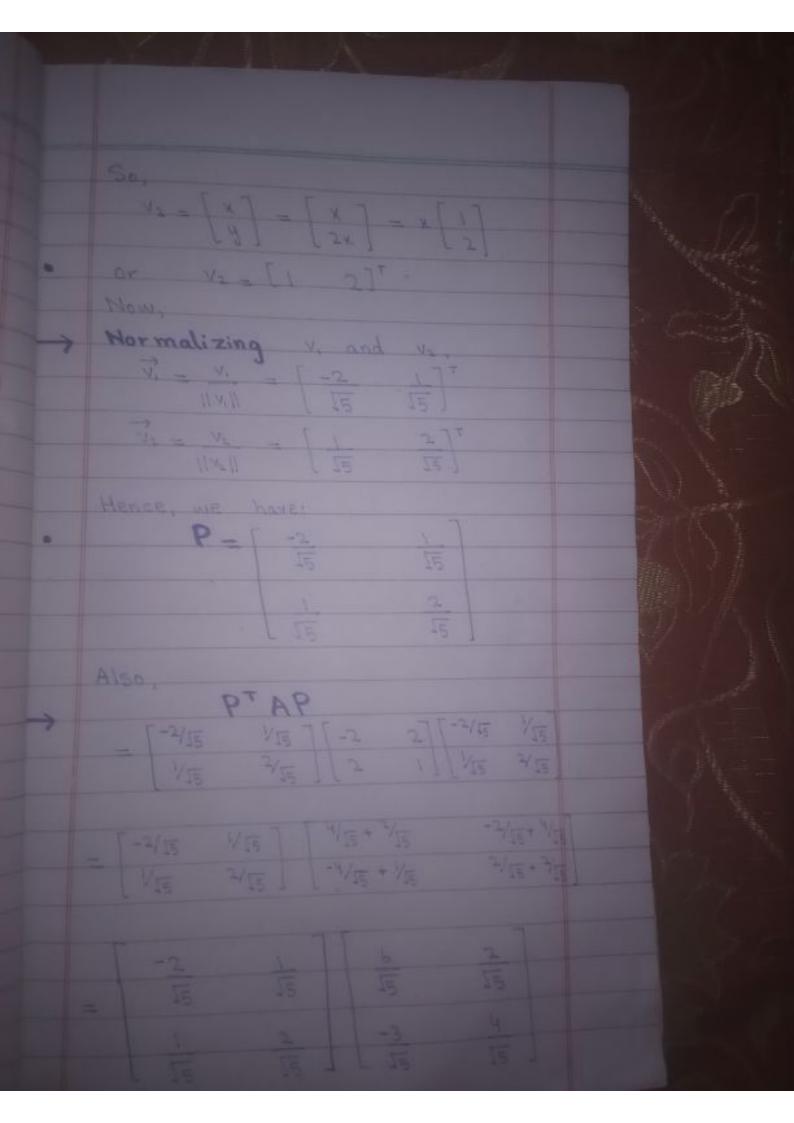
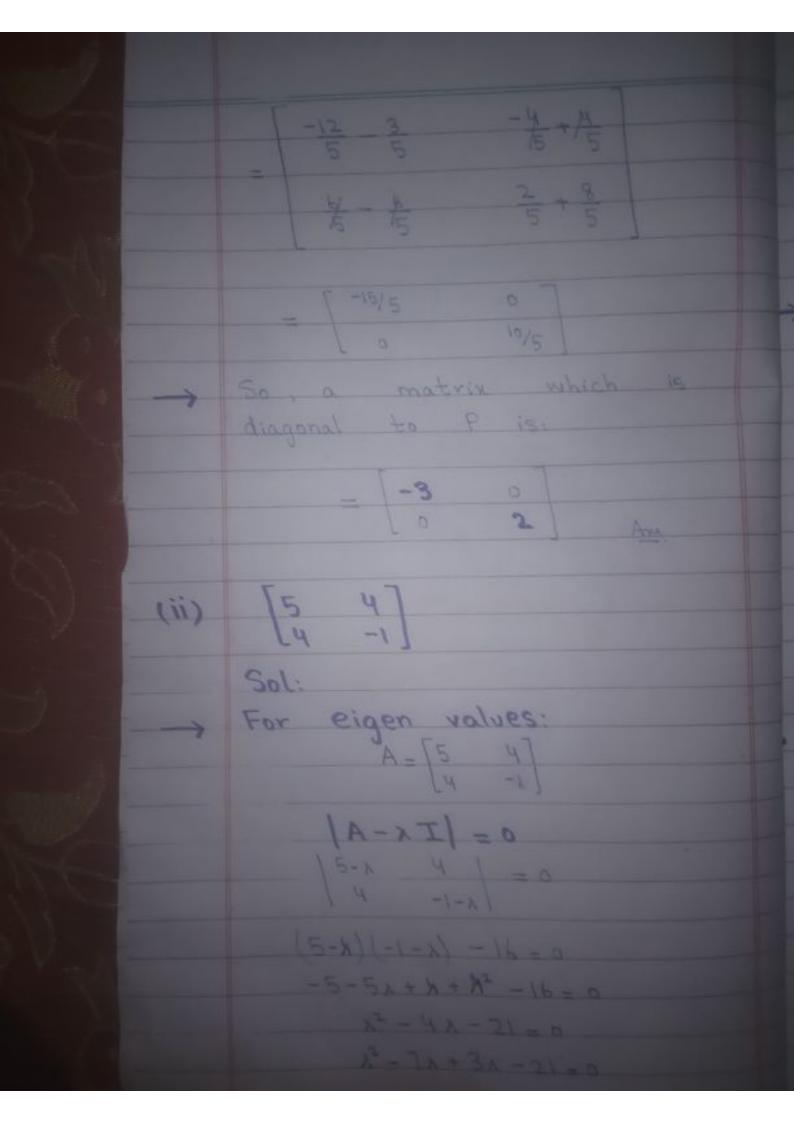
Topic:
"Inner Product Space" · Find eigenvalues, eigen vector and an orthogonal matrix P for which PTAP is diagonal. Q# (1)  $A = \begin{bmatrix} -2 & 2 \\ 2 & 1 \end{bmatrix}$ (i)Sol: For eigen values, |A-XI| = 0 |-2-x 2 | (-2-x)(1-x) - (2)(2) = 0-2+2x-x+x2 -4 = 0 x2 + x - b = 0 x + 3x - 2x - b = 0 x(x+3)-2(x+3)=0



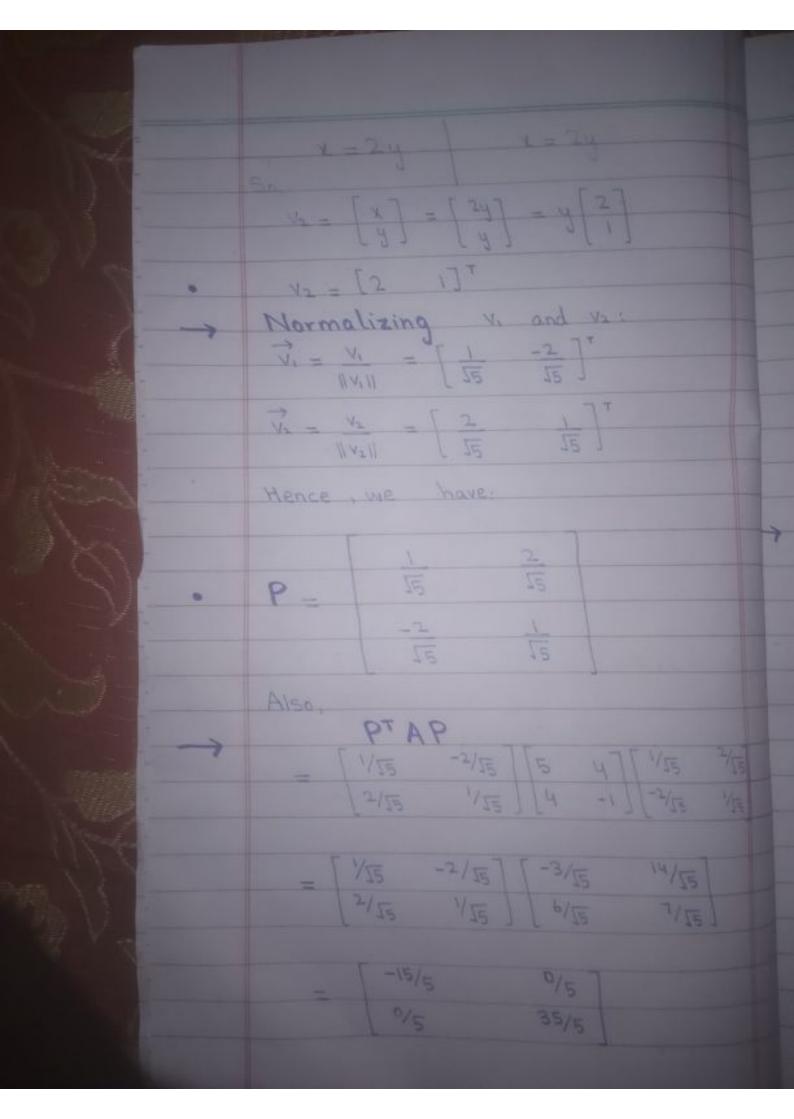


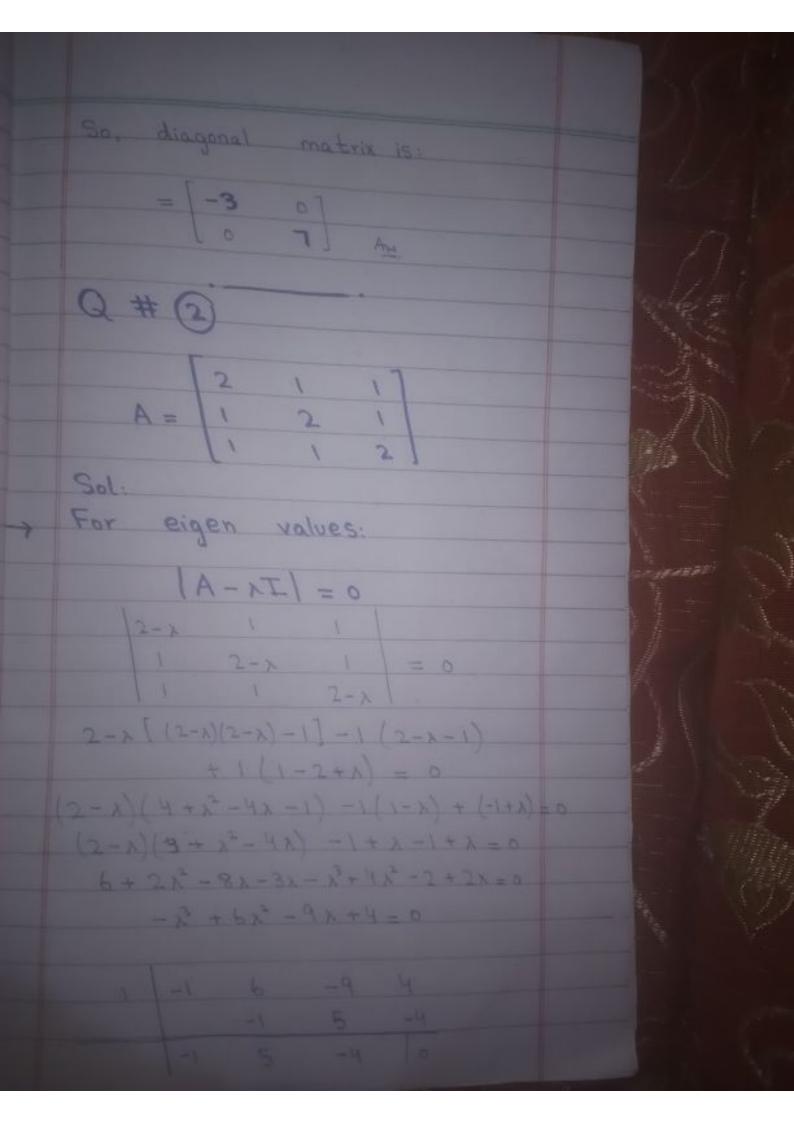


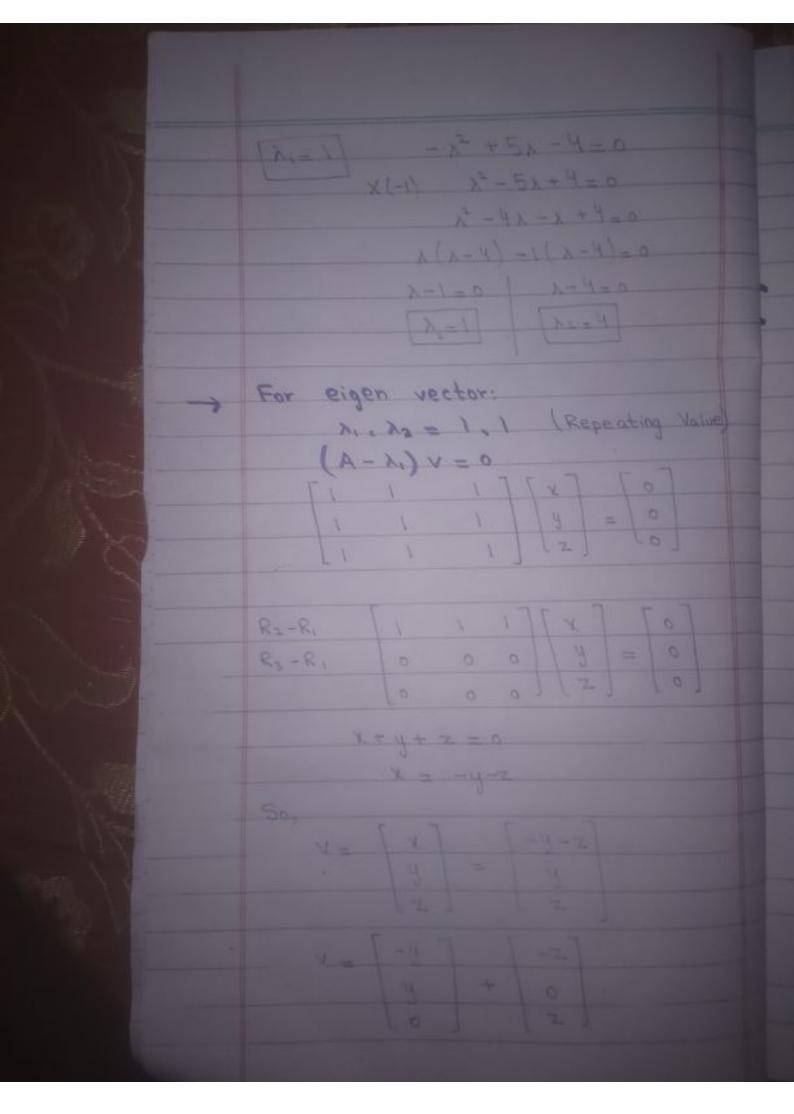
N(N-7)+3(N-7)=0 1+3=0 | A=7=0 > For eigen vector:  $Av_i = \lambda_i v_i$ [5 4][x] = -3[x]  $\frac{1}{4}y = -3x - 5x \qquad \frac{4x - y = -3y}{4x = -3x + y}$   $\frac{4y = -3x - 5x}{4y = -3x} \qquad \frac{4x - y = -3y}{4x = -3y}$ 5x + 4y = -3x 12=7 Av2 = 22 V2

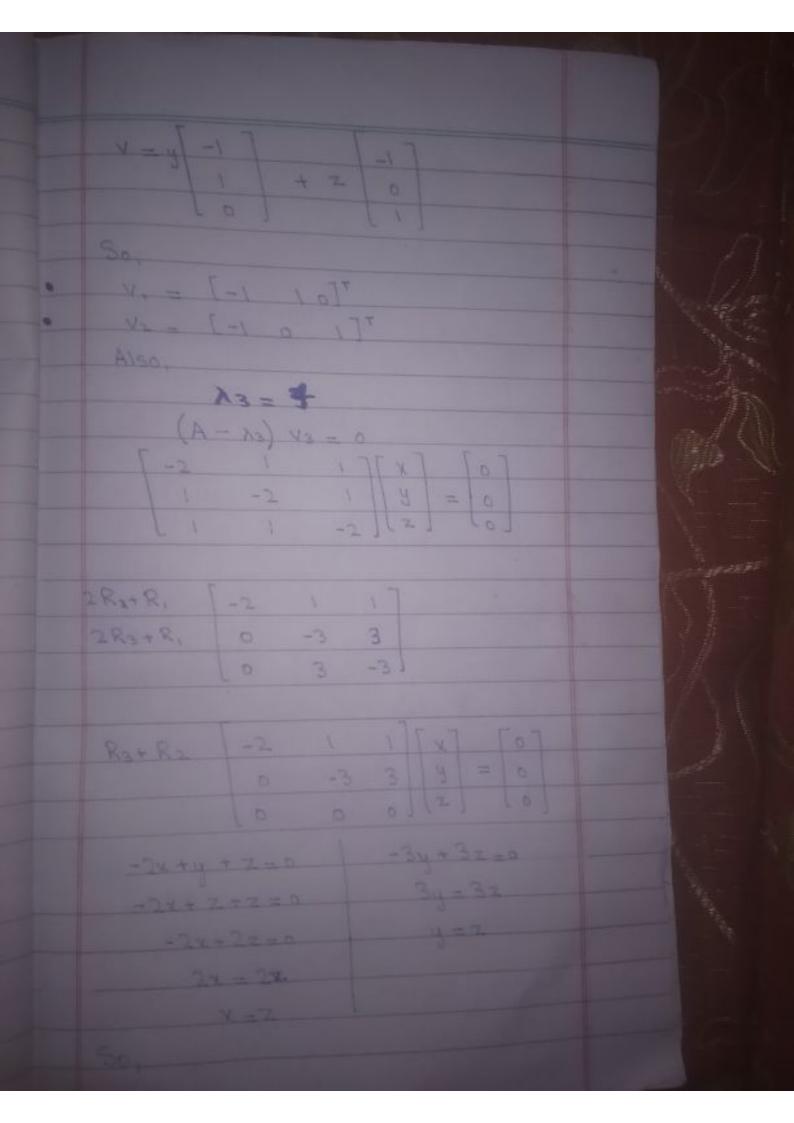
[5 4][x] = 7[x]

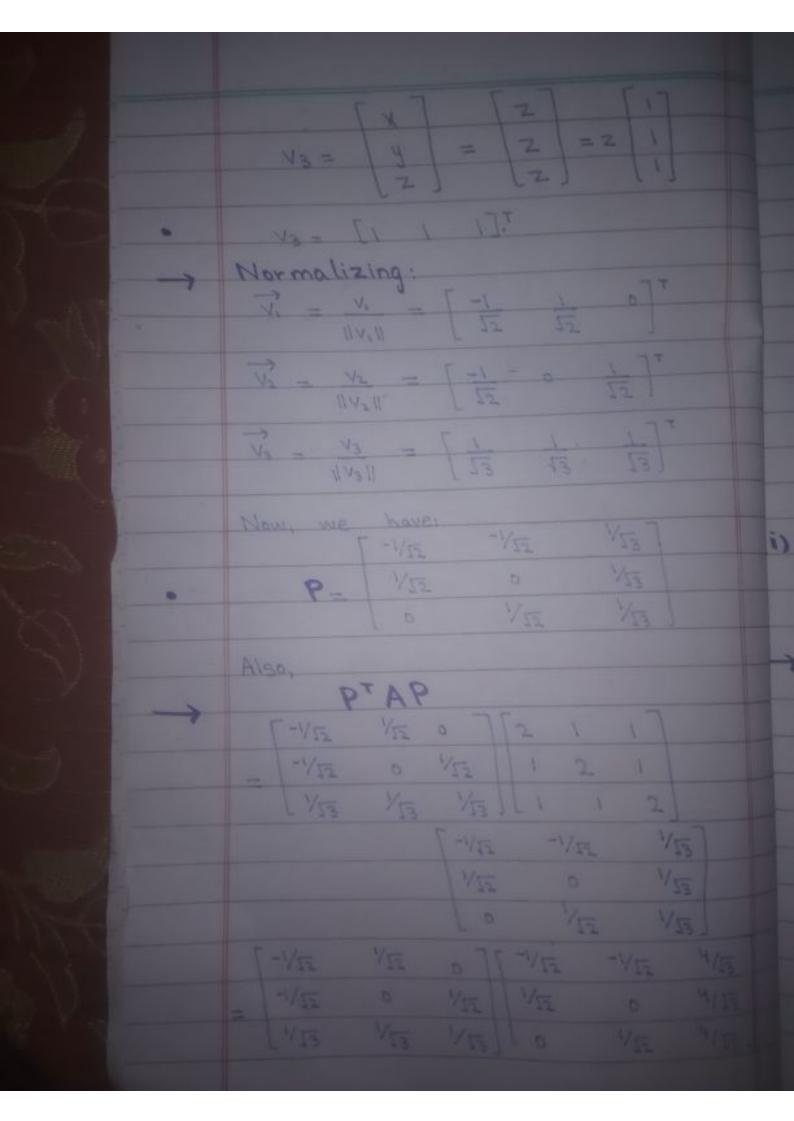
[4 -1 [4] = 7[y]

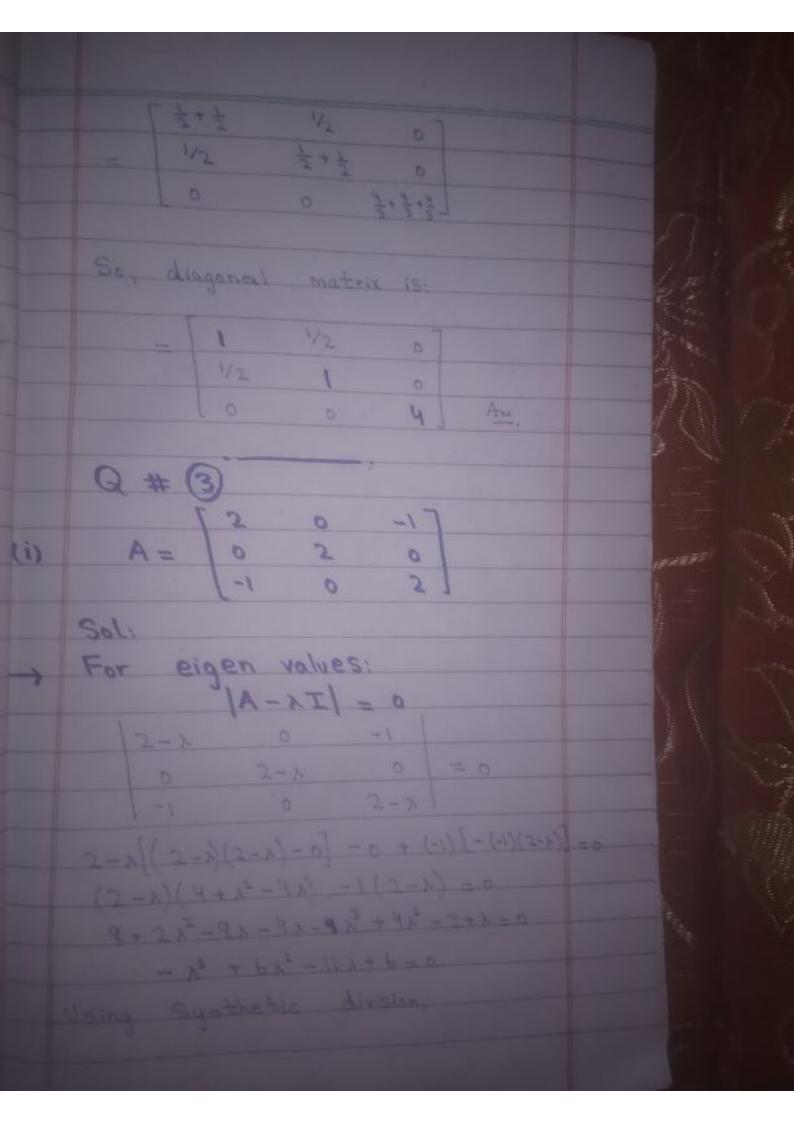


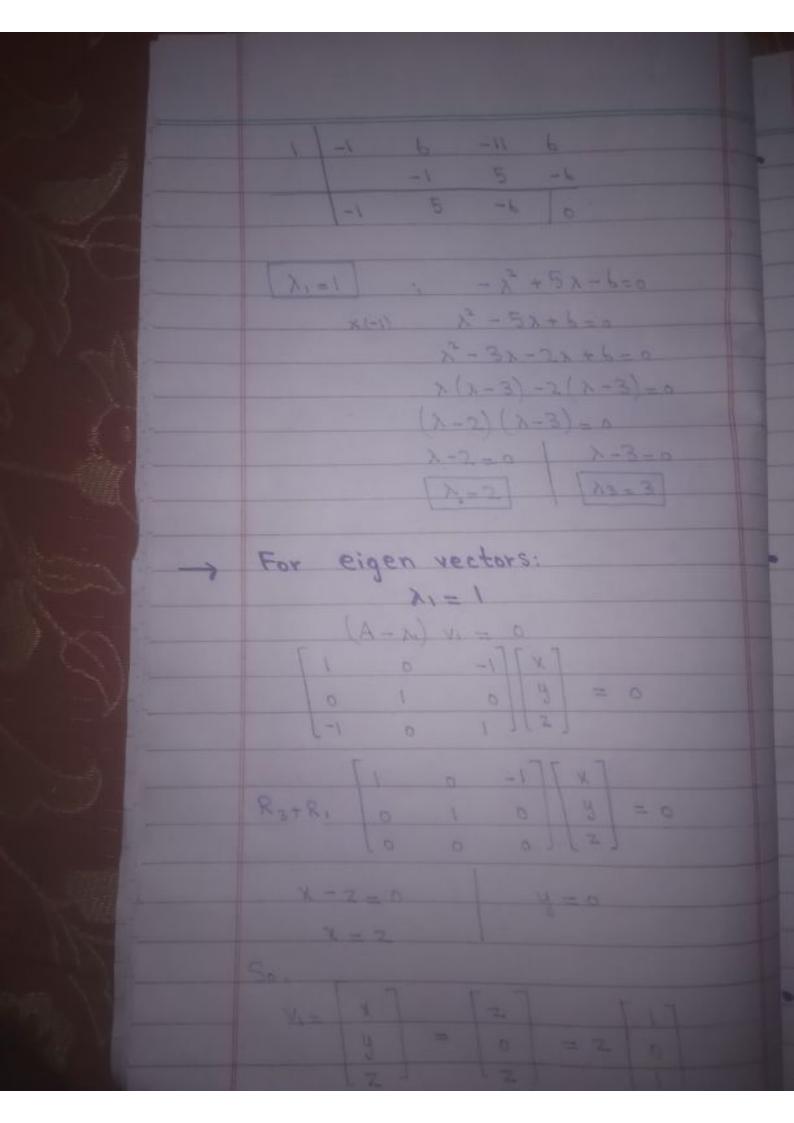


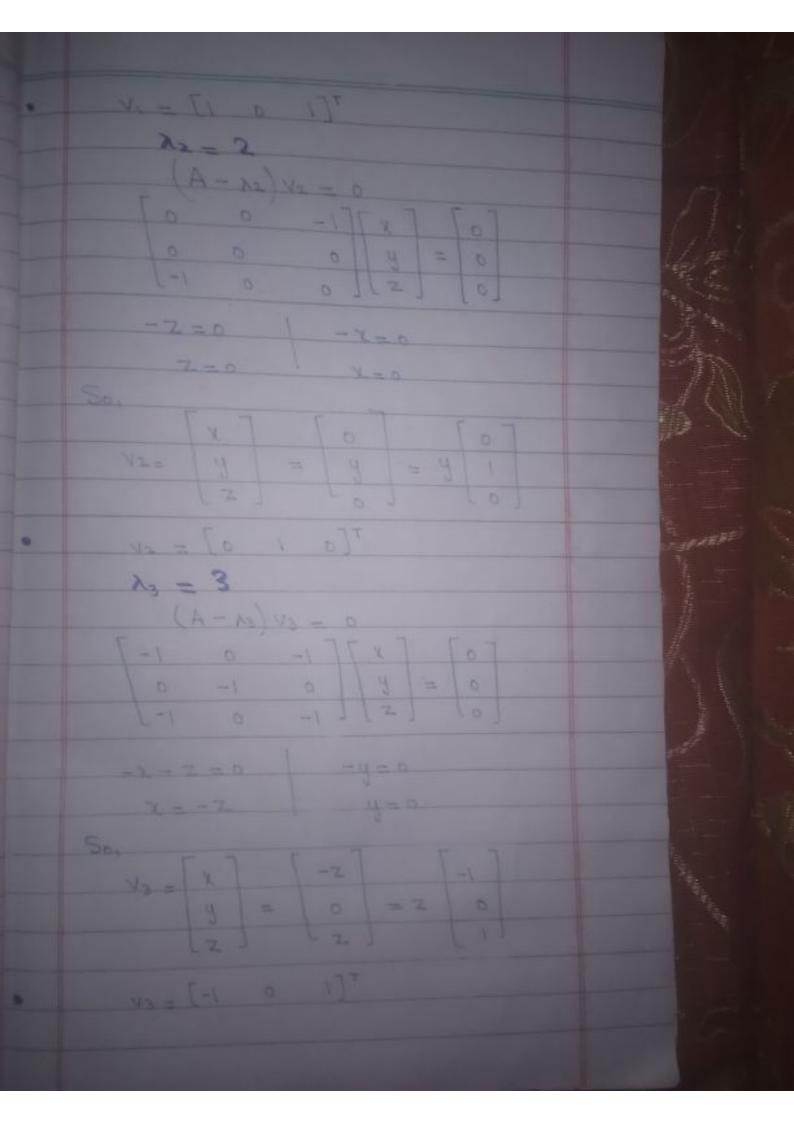


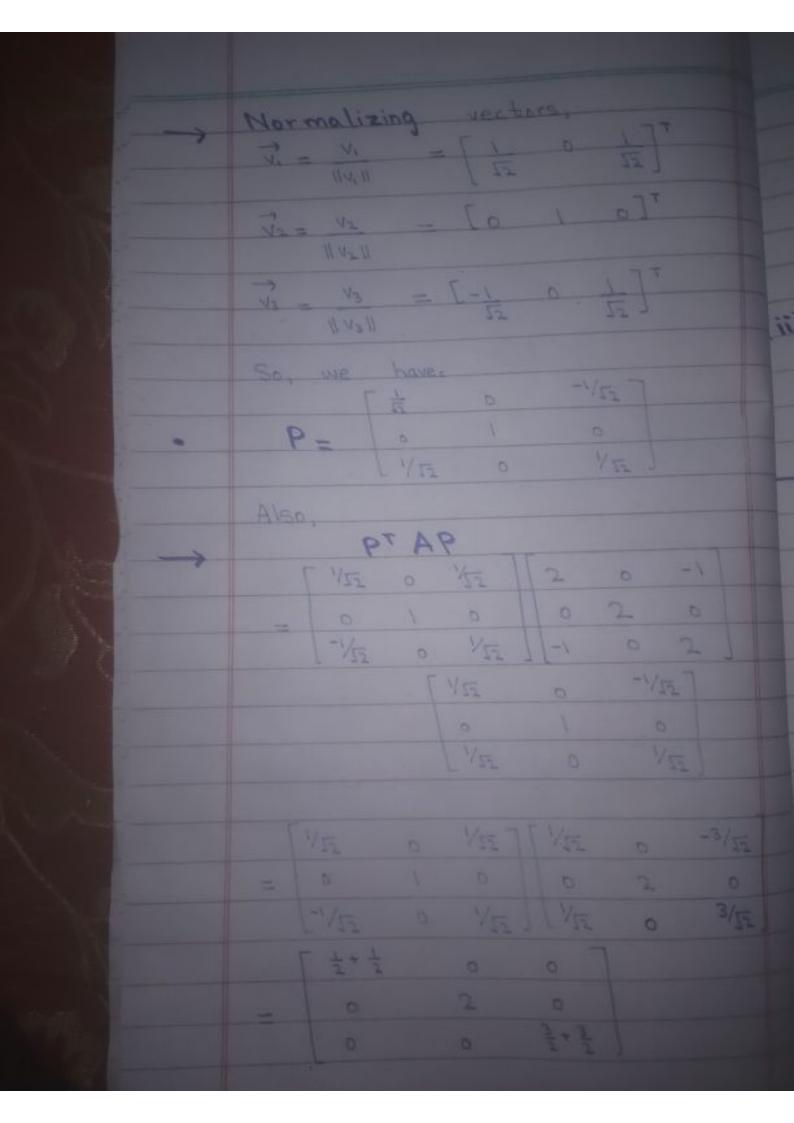


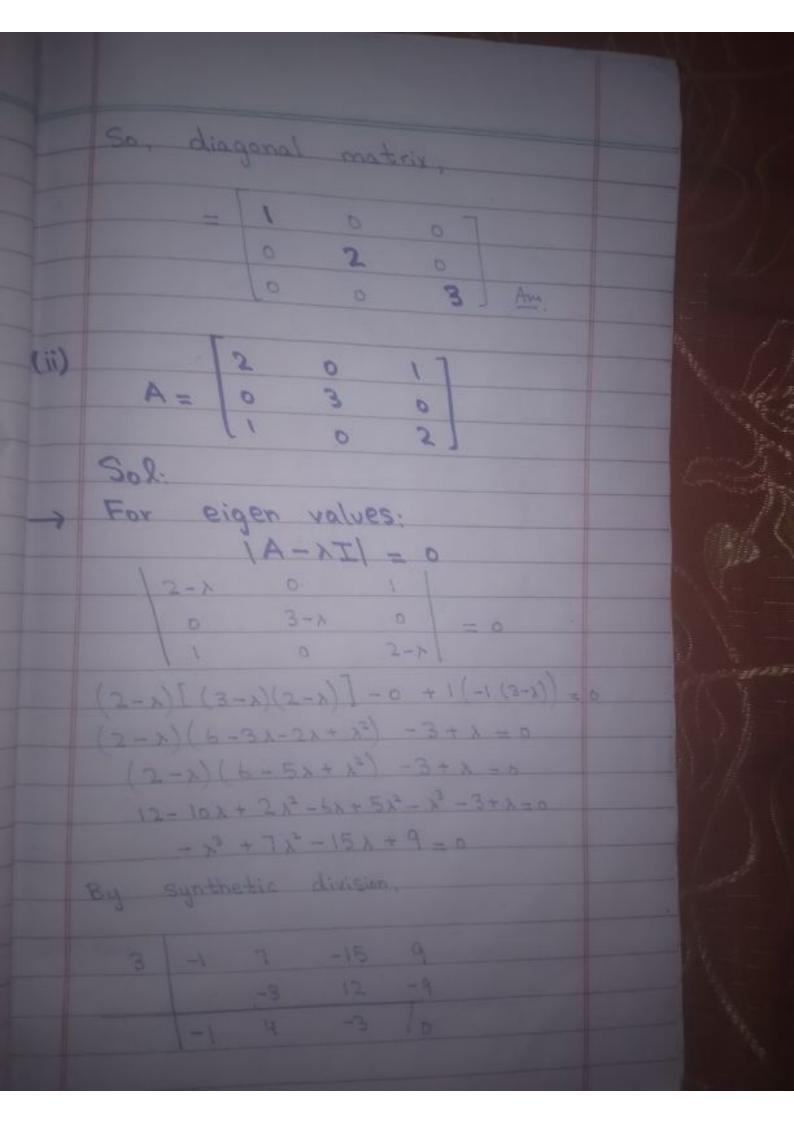


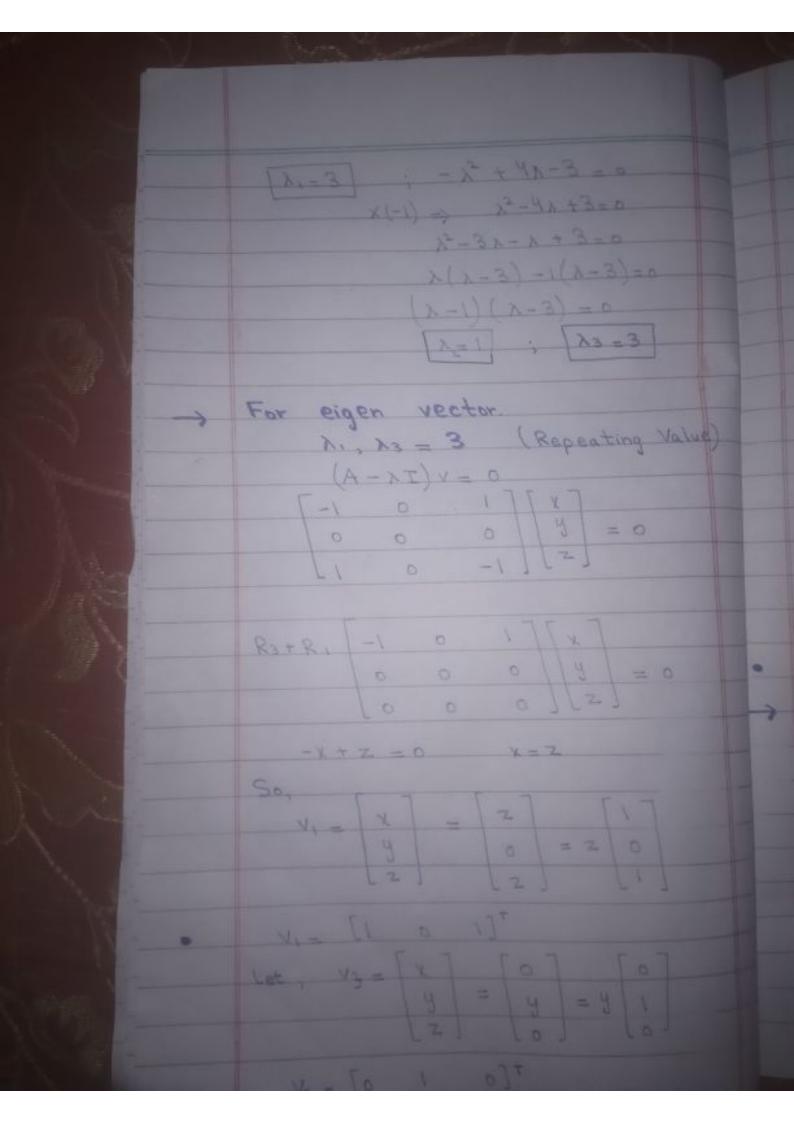


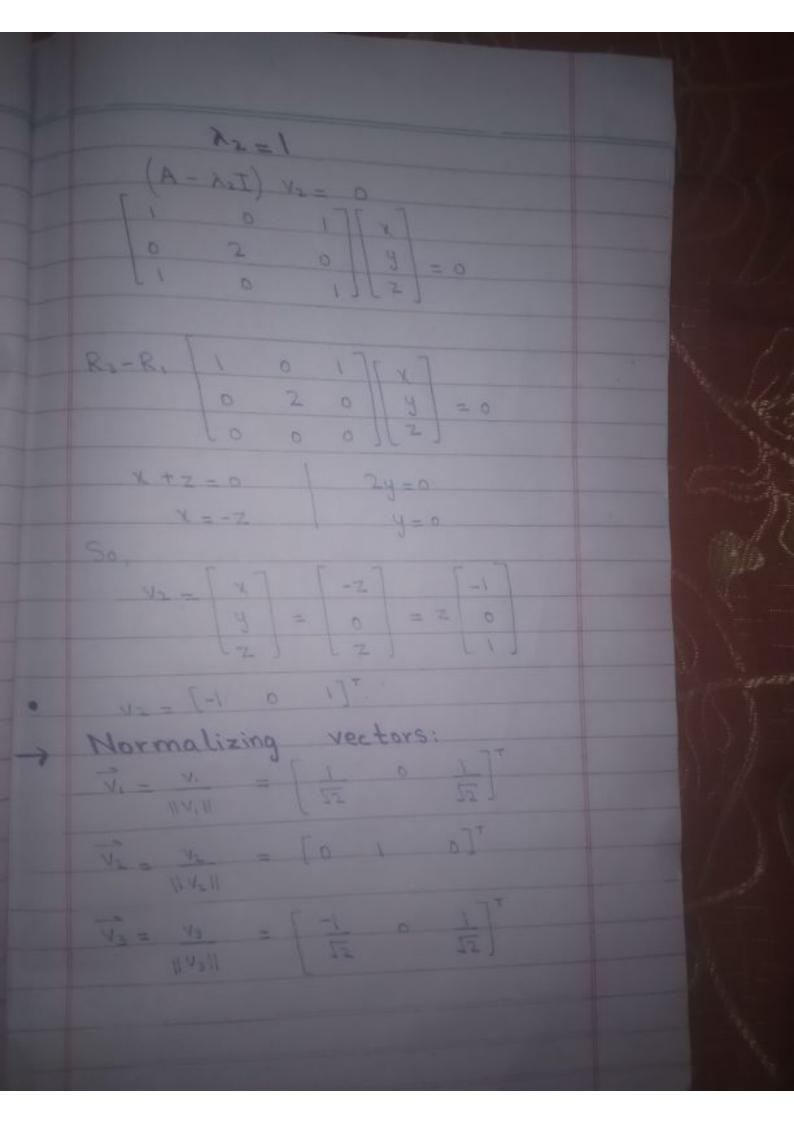


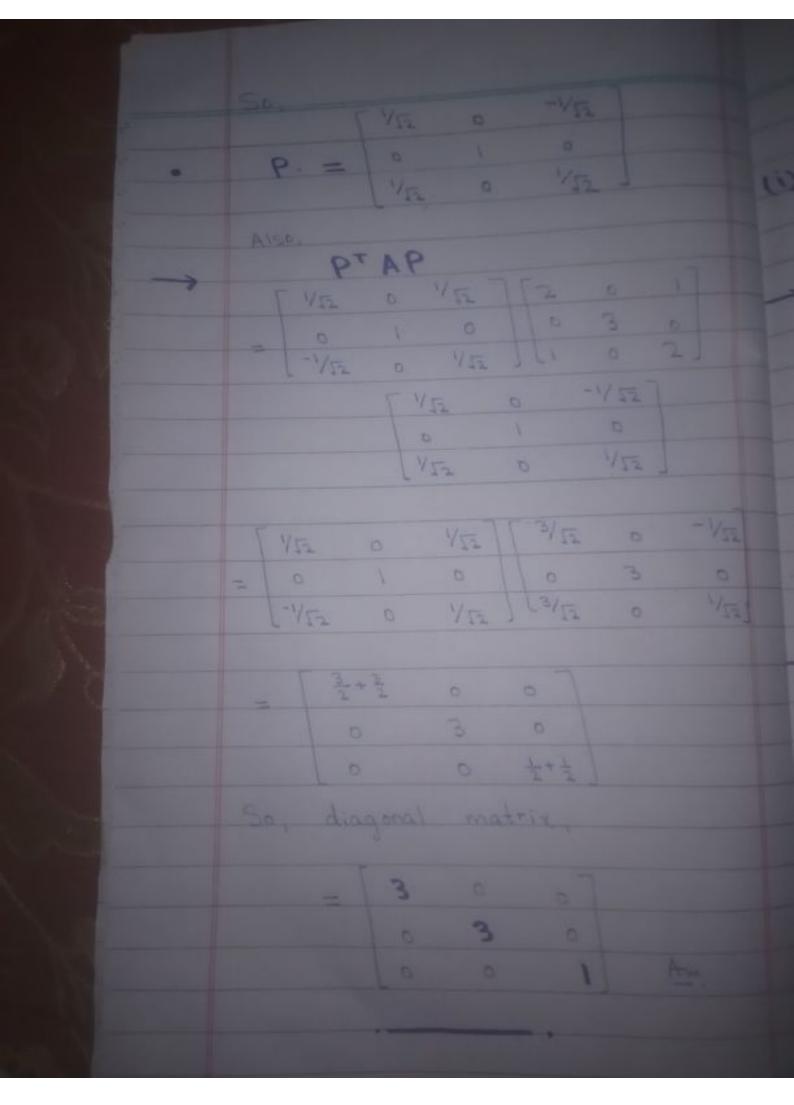


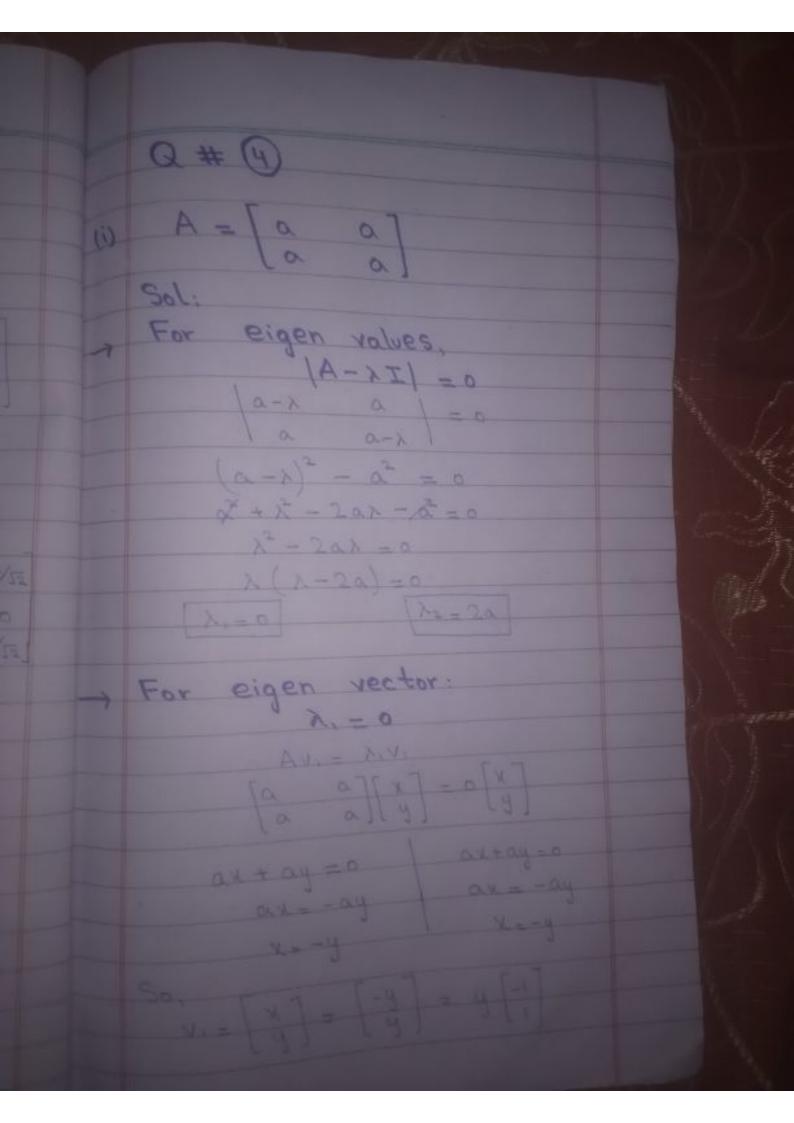












iil Normalizing 11 VIII

