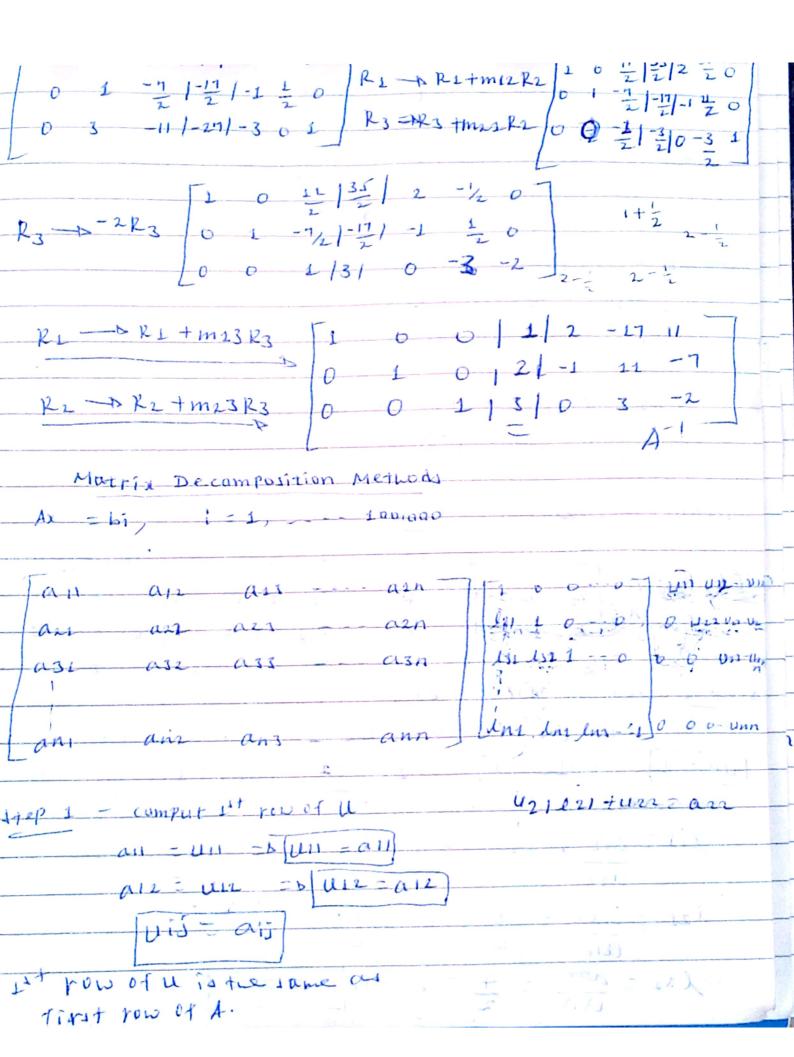
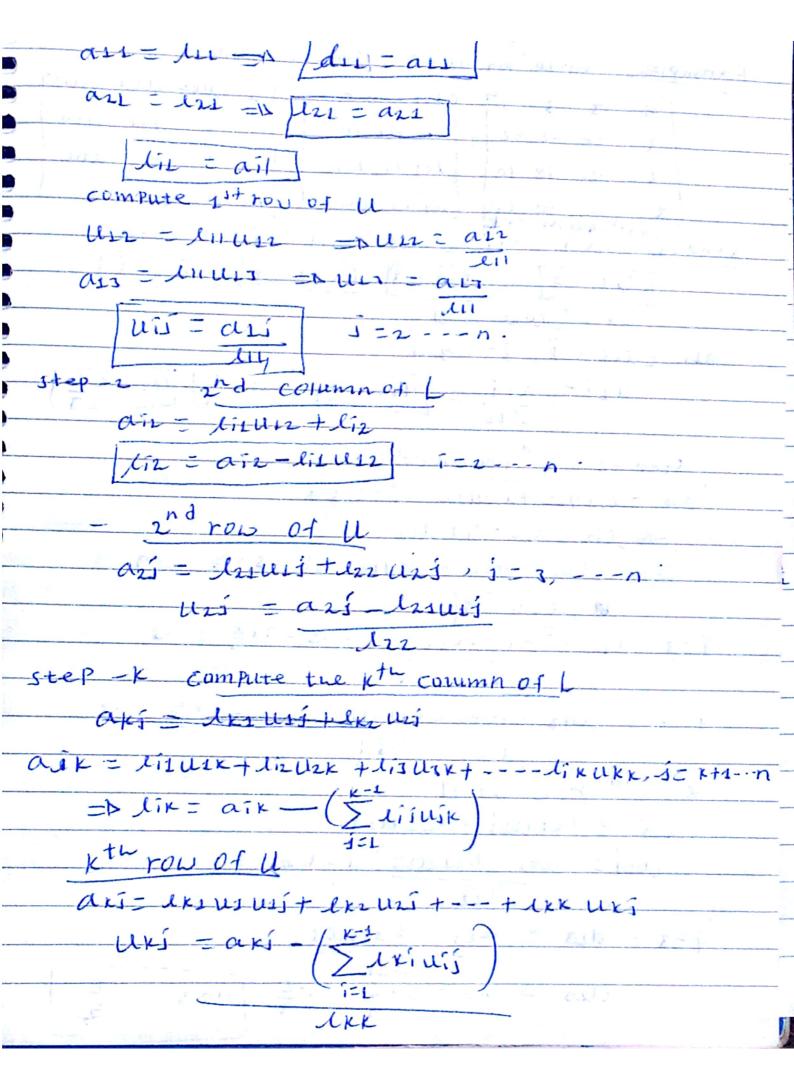
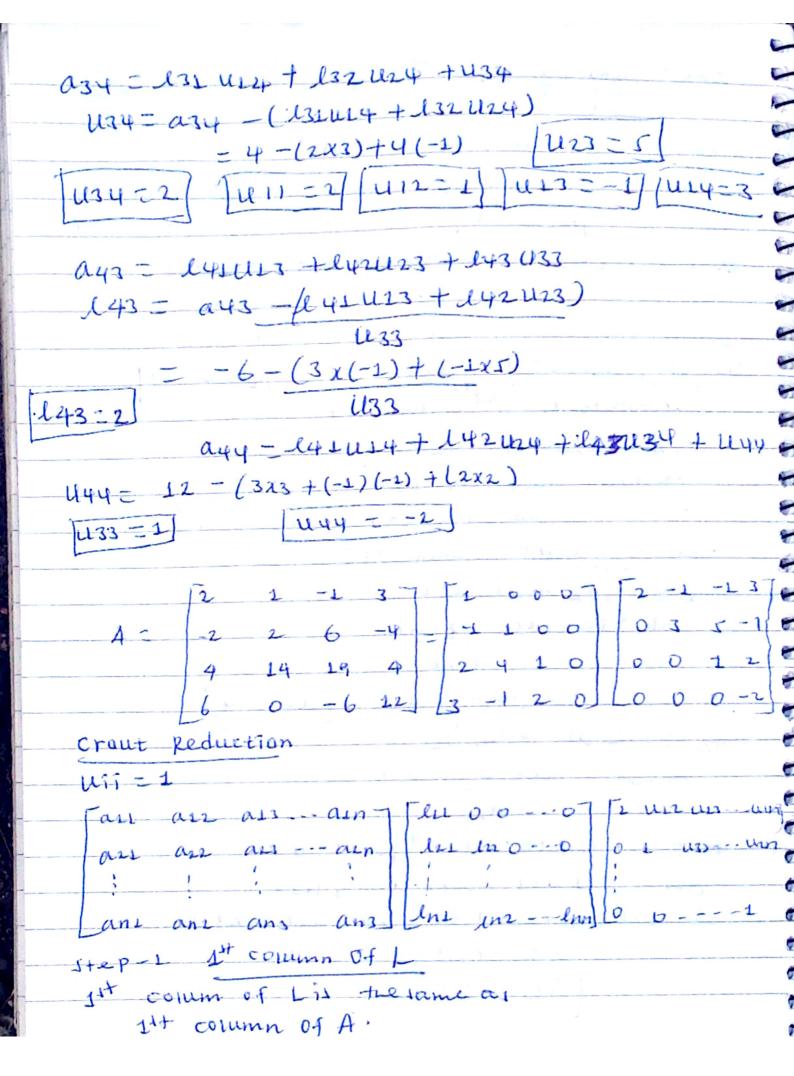
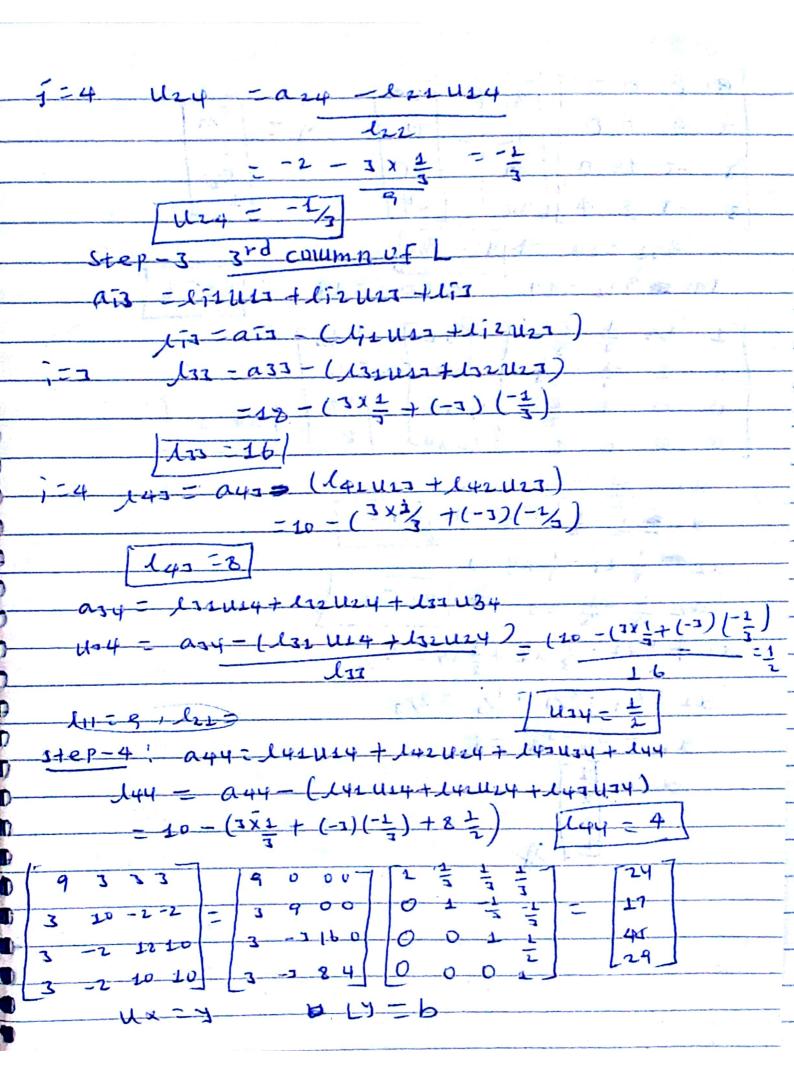
Compute 1tt coumn of azi = 121411 = 0 (121 = azi) as1 = 131 1111 => 131 = a31 liz = a11, 1=2, -- 1. -P-2 - compute 2nd row of H an = luly + 422 U22 = a22 - 125 U12 ans = 123 413 + 1123 = 12 1123 = and - 125 1143 U25 = a25 - 121415 20011tte's method / lis =1 -1 3 1 0 0 -4 - lez 1 0 0 4 | list list to 0 0 433 474 = aii i e tre 1st row of U is the same as P-1 compute 11+ row of 11 Bis = aif life the Lit row of U is the same as 111-2 | Nd2=1 | 1127 = -1 | 114-3 compute the 1st column of 1 list ail, jez, ... 411 111 = 4 = 2 = D /31 = 2

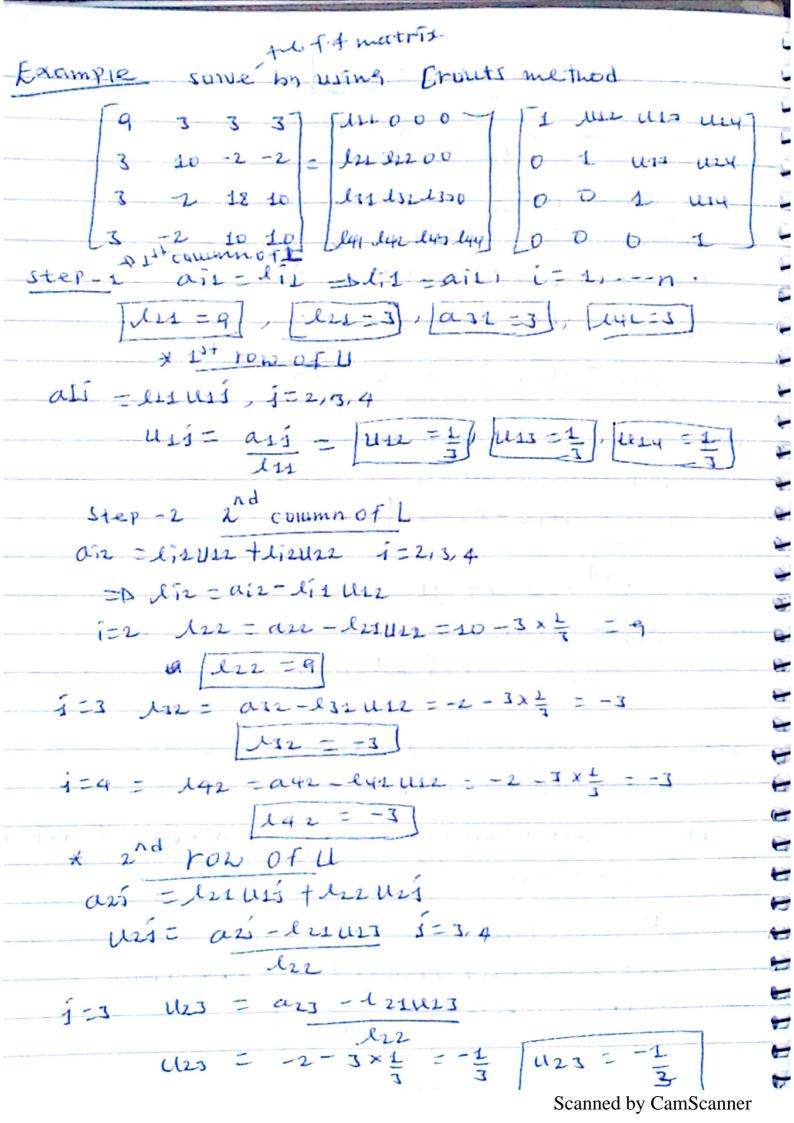


 $\frac{a41 = 6}{2} = 3 = 1$ compute 2nd row of u an = 121412 + 422 = b 422 = a22 - 121412 =2-(-1)(1)=3 U22 = 3 43) a23 = 121 4113 + 1123 = 12 1123 = a23 - 121 1113 U27=5 6-L = , U12=1, U13==1), U14=3 compute the 2nd column of L az4 = 12144 - 424 => 1124 = azy -121 114 - -4 - (-1) (3) 124compute the 2nd column Of L Clar = 13142 + 132 1122 -D 232 - 032 - 12) UIZ 1 1 1122 10 132 = 4 =14-2(1) 10 44 1112 + ly2 1/22 - a42 - 141 ULZ 1 1/22 10 1 Hep-1 compute the 3rd row of u 10 ass - 131 1117 + 132 1123 + 1133 10 => U32 = a33 - (l31 U12 + 132 U23) 117 - 19-(2)(-1) + 4x1) 10 1 U33 = 1











V.goodl.

## ARBA MINCH UNIVERSITY COLLEGE OF NATURAL SCIENCES DEPARTMENT OF MATHEMATICS

Course Title: Numerical Methods Test 2

Name: Bruk Gutema ID number: 011/09

1. Solve the system Ax = b using the Doolittle decomposition where (7 points)

$$\mathbf{A} = \begin{bmatrix} 1 & 2 & 1 \\ -2 & -3 & 0 \\ 3 & 5 & 2 \end{bmatrix}, \quad \mathbf{b} = \begin{bmatrix} 1 \\ 0 \\ 1 \end{bmatrix}$$

2. Find the solution of the system of equations

(7 points)

$$x_1 - 3x_2 + 7x_3 = 17$$

$$3x_1 - 6x_2 + 2x_3 = 23$$

$$-4x_1 + x_2 - x_3 = -8$$

correct to one decimal place using <u>Gauss</u> Siedel method with an initial guess of  $x^{(0)} = [0.9, -3.1, 0.9]^T$ .

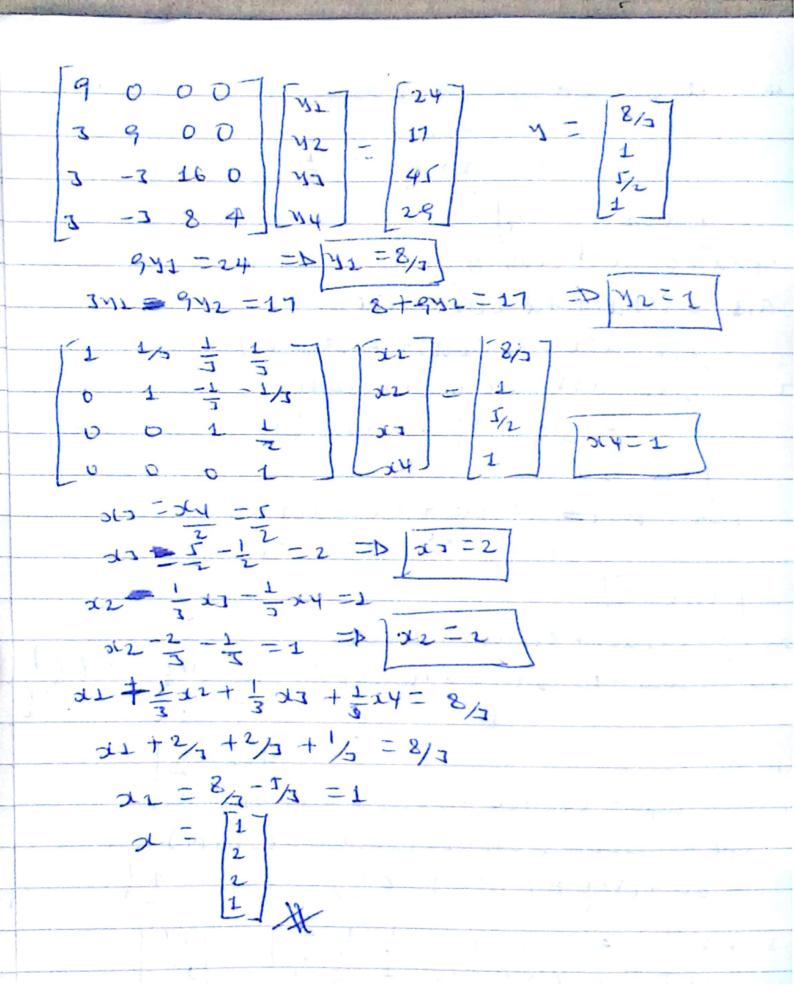
3. Perform two iterations Newton's Method in approximating the solution of the non-linear system

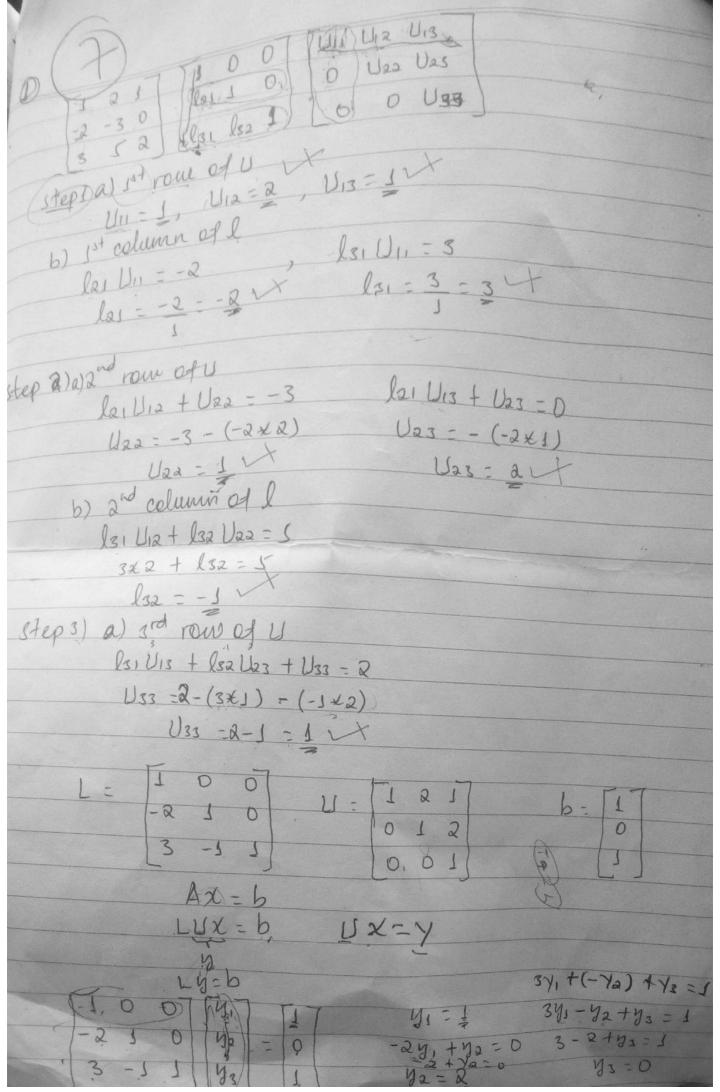
$$x^2 + y^2 - 2 = 0$$

$$x^3 - y = 0$$

an initial guess  $\boldsymbol{x}^0 = [0.5, 0]^T$ .

(6 points)





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