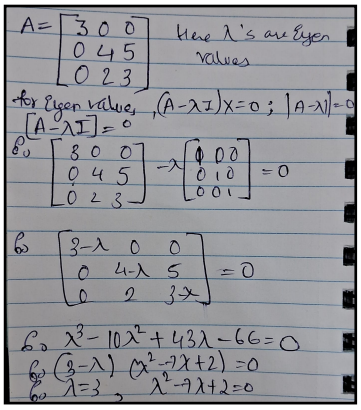
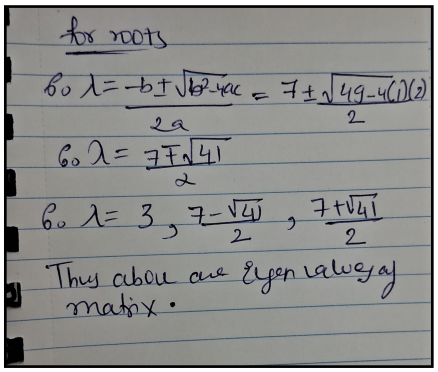
NAME: OM M PATEL
ROLL NO. : 21BCP094
DIV: 2
GROUP : 3

Lab Assignment 1

1. **Assume one 3 by 3 matrix as 1st row [3, 0, 0], 2nd row [0, 4, 5], and third row [0, 2, 3]. Calculate the possible eigenvalues for the matrix.**

Handwritten Solution :





Code:

```
import numpy as np

def user_matrix():
    print("Eigen Values can be calculated only of square matrix, Thus N=M")
    N = int(input("Enter no. of Rows (N)"))
    M = int(input("Enter no. of columns (M)")  )
    if N != M:
        print("Matrix A is not square.”)

    A = []
    print("Enter the elements row by row (each element separated by a space):")

    for i in range(N):
        while True:
            row = input().strip().split()
            if len(row) != M:
                print(f"Error: You must enter exactly {M} elements.")
```

```
            else:
                A.append([float(x) for x in row])
    return np.array(A)



def main():
    A = user_matrix()
    ans = np.linalg.eigvals(A).round(4)
    print("Eigen Values for your Matrix is : ",ans)

if __name__ == "__main__":
    main()
```

Output:

```
(base) om-college@OM-M-PATEL-MACBOOK-M1-AIR PR % python3 21BCP094_Lab_Assignment_1.py
Eigen Values can be calculated only of square matrix, Thus N=M
Enter no. of Rows (N)3
Enter no. of columns (M)3
Enter the elements row by row (each element separated by a space):
3 0 0
0 4 5
0 2 3
Eigen Values for your Matrix is :  [0.2984 6.7016 3.    ]
```