

## **ASSIGNMENT-1**

### **QUESTION-2**

**TEST CASE-1** :  $f(x)=600*x^4 - 550*x^3 + 200*x^2 - 20*x - 1= 0$

#### **1. Muller Method**

##### **INPUT:**

Choose the method of solution by selecting number shown with method: Muller-1, Bairstow-2

1

Enter the degree of Polynomial  $f(x)$ :

4

Enter (degree+1) number of coefficients in increasing order of degree separated by a space:

-1 -20 200 -550 600

Enter the first starting point

0.0

Enter the second starting point

0.1

Enter the third starting point

0.3

Enter the stopping criteria:

Enter the maximum number of iterations allowed

20

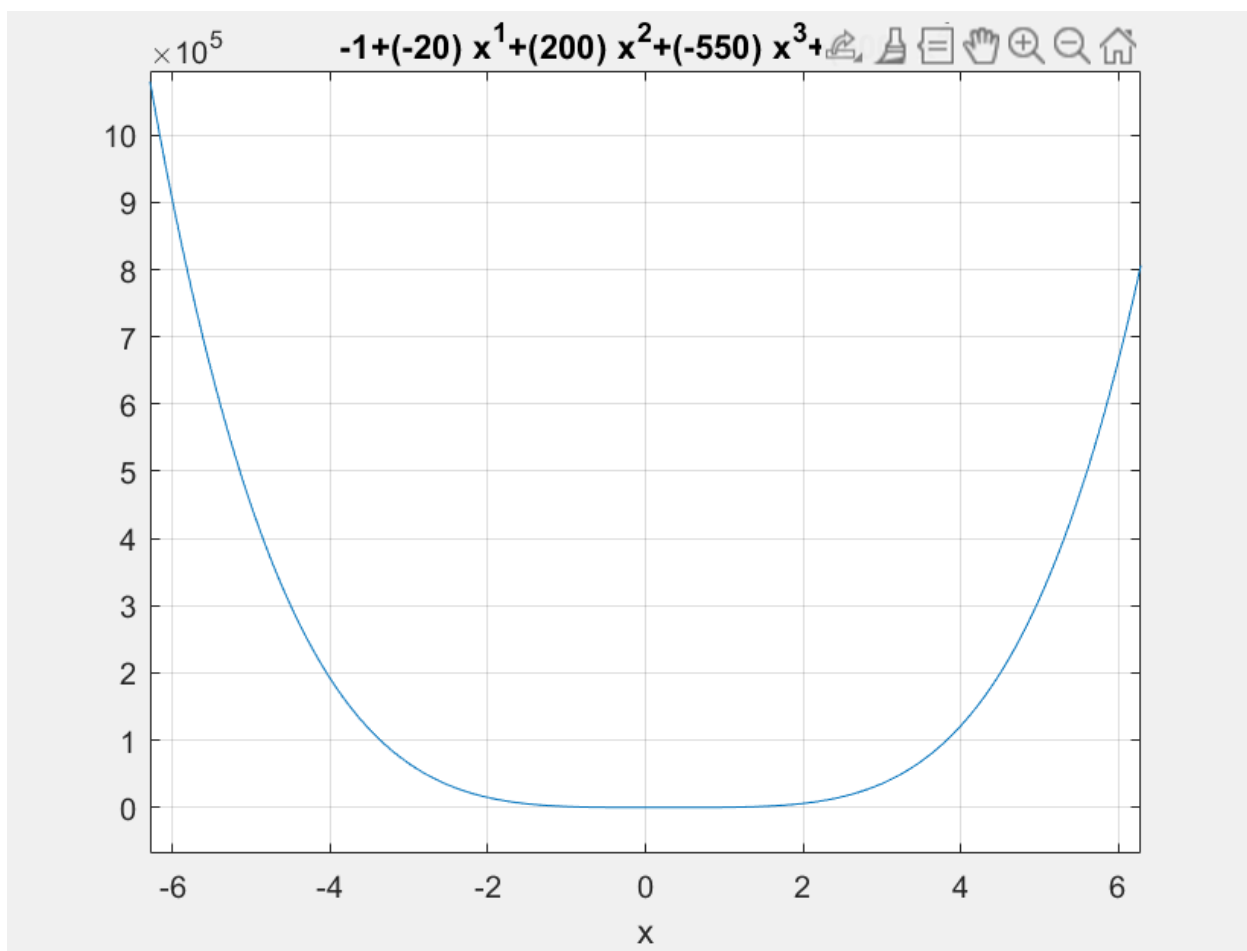
Enter the maximum relative approximate error allowed(in %)

0.05

##### **OUTPUT:**

Root is NaN+0.000000i

Iterations stopped: Maximum relative error stopping criteria met



## 2. Bairstow Method

### INPUT:

Choose the method of solution by selecting number shown with  
method: Muller-1, Bairstow-2

2

Enter the polynomial  $f(x)$ :  $600x^4 - 550x^3 + 200x^2 - 20x - 1$

Enter starting value of r: -1

Enter starting value of s: -1

Enter the maximum relative approximate error allowed(in %):

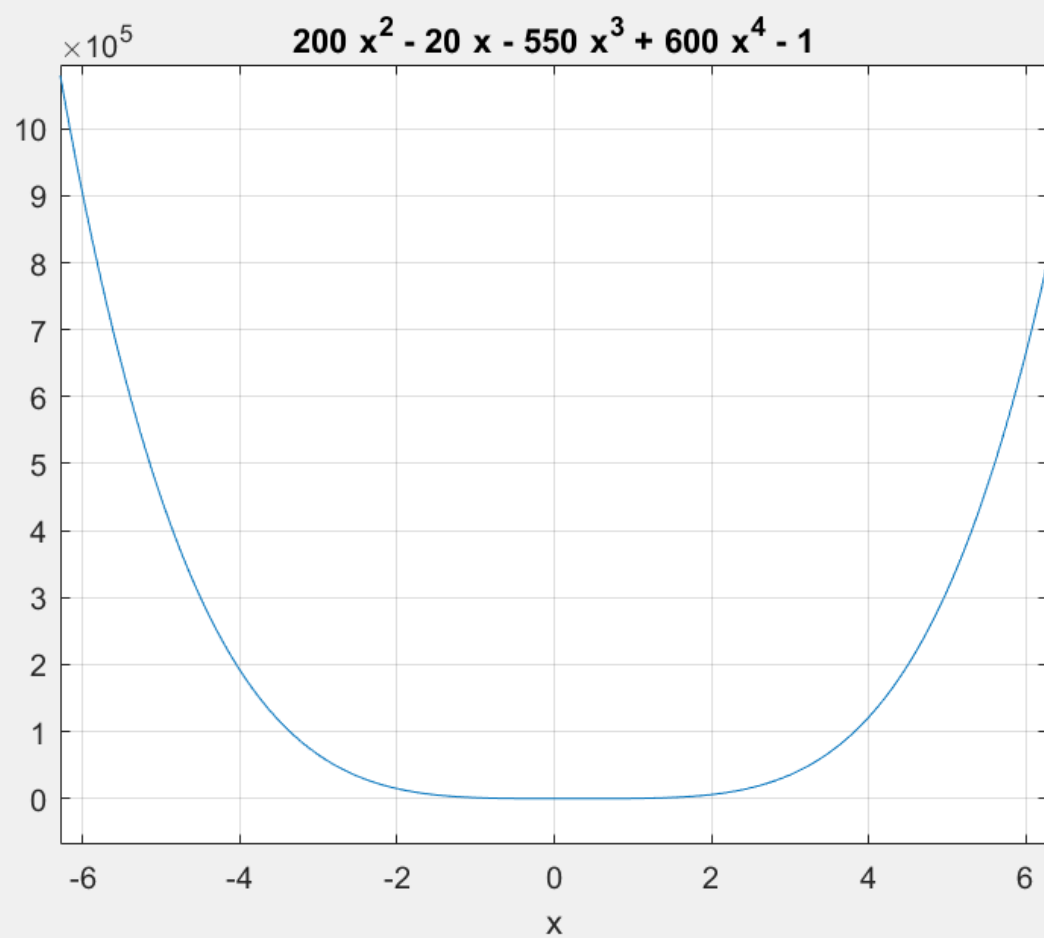
0.05

Enter the maximum number of iterations allowed: 20

### OUTPUT:

Roots of the function are: 0.232353, -0.035840

Roots of the function are:  $129620.181797 + 95567.867372i$ ,  
 $129620.181797 - 95567.867372i$



## **TEST CASE-2 : $f(x)=x^3 + x^2 - 4x -4 = 0$**

### **1. Muller Method**

#### **INPUT:**

Choose the method of solution by selecting number shown with method: Muller-1, Bairstow-2

1

Enter the degree of Polynomial  $f(x)$ :

3

Enter (degree+1) number of coefficients in increasing order of degree separated by a space:

-4 -4 1 1

Enter the first starting point

0.0

Enter the second starting point

0.5

Enter the third starting point

1.0

Enter the stopping criteria:

Enter the maximum number of iterations allowed

20

Enter the maximum relative approximate error allowed(in %)

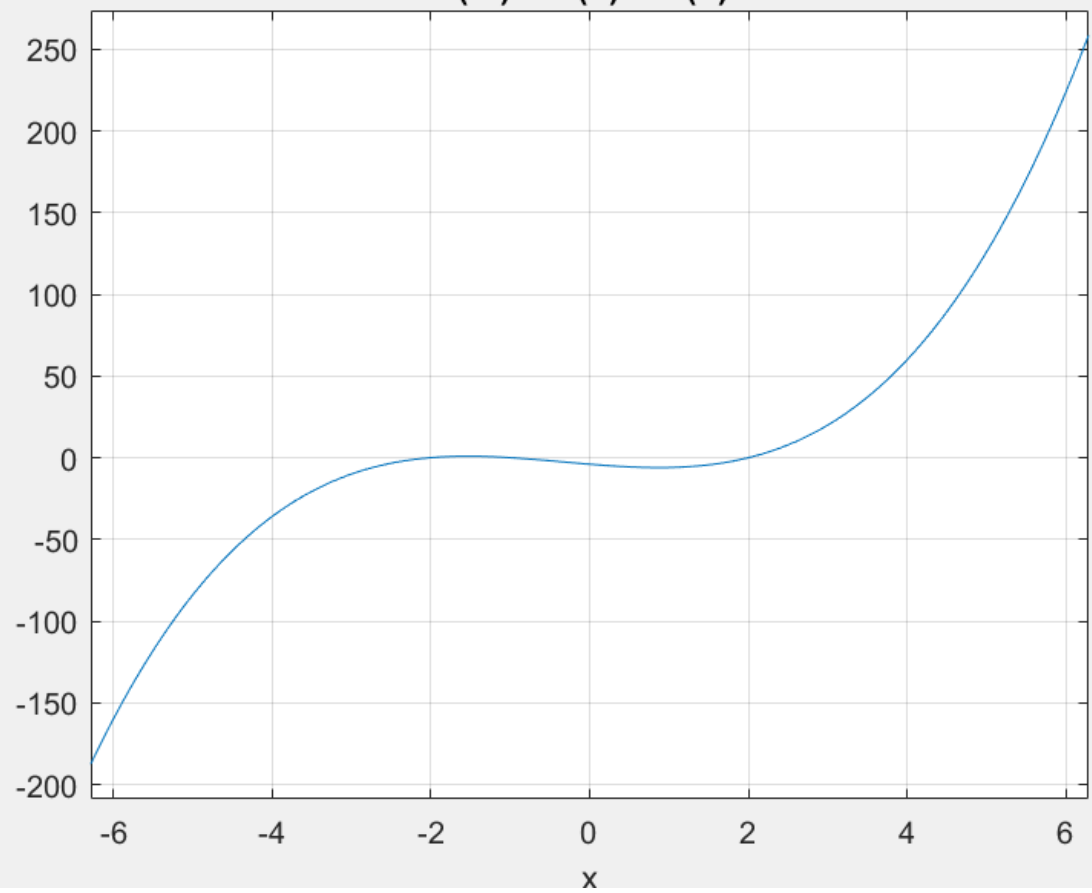
0.05

#### **OUTPUT:**

Root is NaN+0.000000i

Iterations stopped: Maximum relative error stopping criteria met

$$-4 + (-4)x^1 + (1)x^2 + (1)x^3$$



## **2. Bairstow Method**

### **INPUT:**

Choose the method of solution by selecting number shown with  
method: Muller-1, Bairstow-2

2

Enter the polynomial  $f(x)$ :  $x^3 + x^2 - 4x - 4$

Enter starting value of  $r$ : -1

Enter starting value of  $s$ : -1

Enter the maximum relative approximate error allowed(in %):  
0.05

Enter the maximum number of iterations allowed: 20

### **OUTPUT:**

Roots of the function are: 2.000000, -1.000000

Roots of the function are: -2.000000

$$x^2 - 4x + x^3 - 4$$

