

ESO208 Programming Assignment

$$A.f(x) = x - \cos x$$

1 Bisection

OUTPUT:

The root is:7.390747070e-01

Terminated due to condition 1

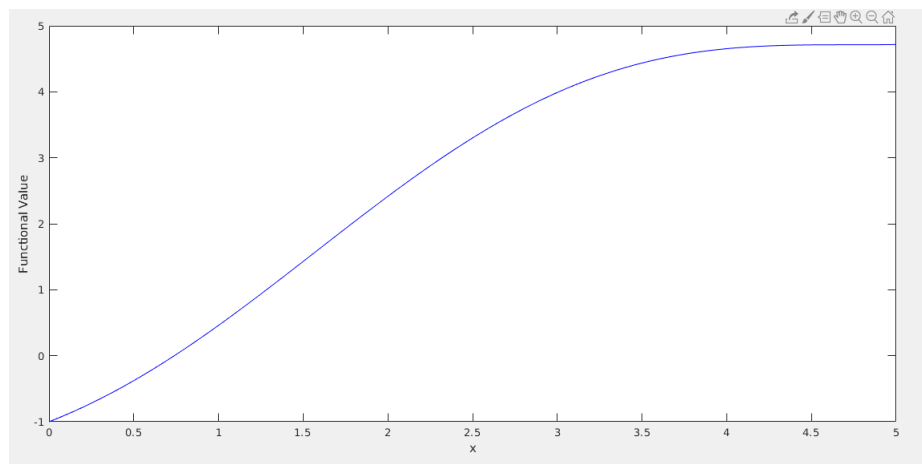


Figure1.1.1

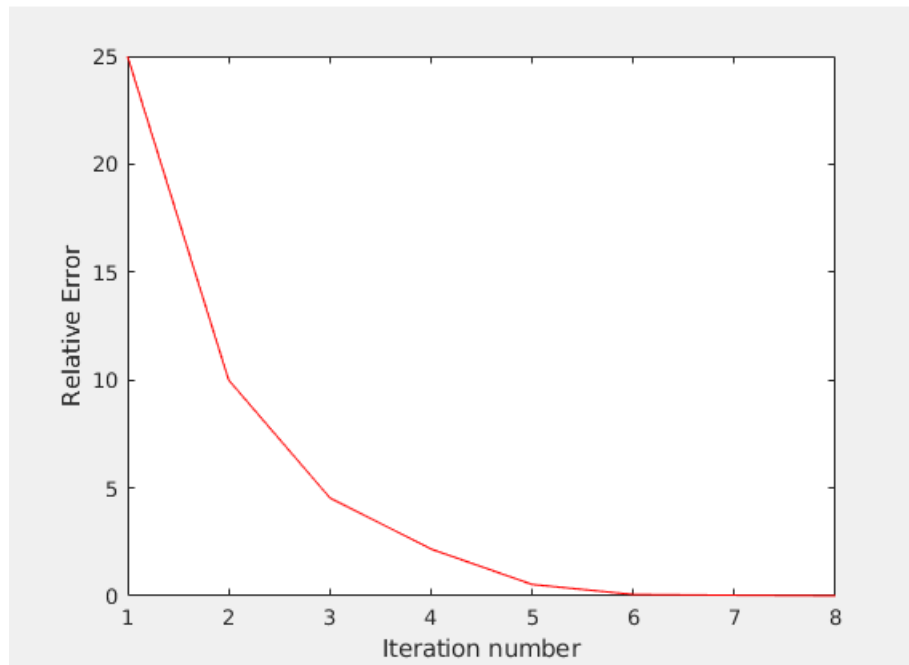


Figure1.1.2

2 Regula-Falsi

OUTPUT:

The root is:7.390847824e-01
Terminated due to condition 1

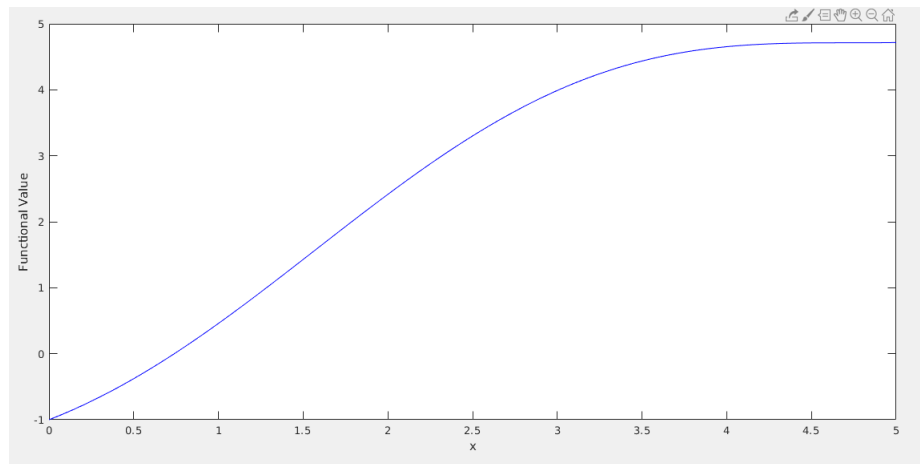


Figure1.2.1

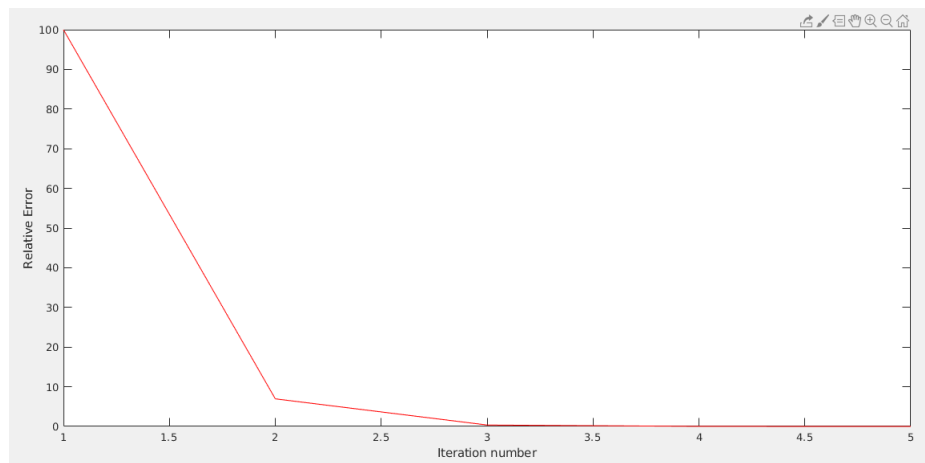


Figure1.2.2

3 Fixed Point

OUTPUT:

The root is:7.391055719e-01
Terminated due to condition 1

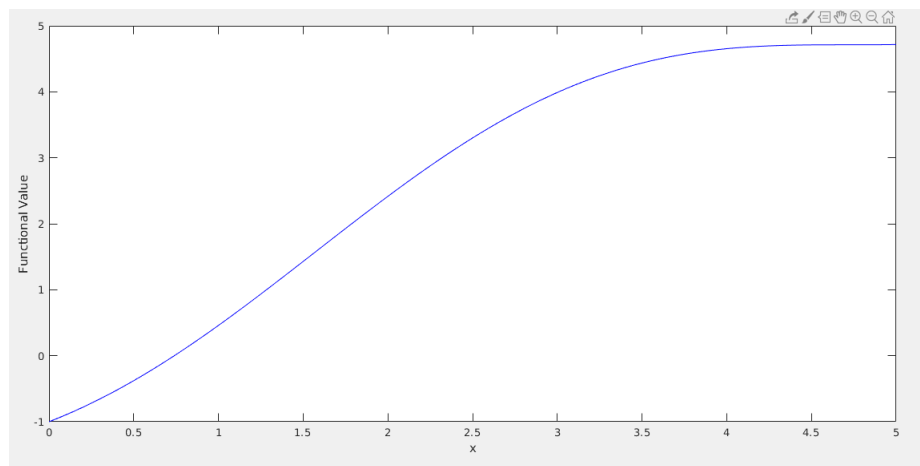


Figure1.3.1

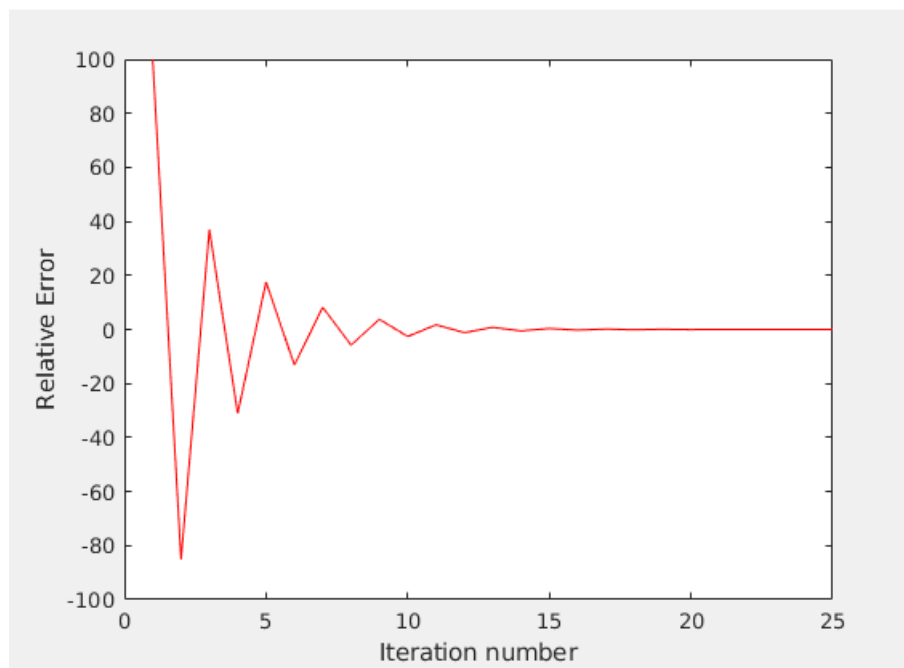


Figure1.3.2

4 Newton Raphson

OUTPUT:

The root is: 7.390851334e-01

Terminated due to condition 1

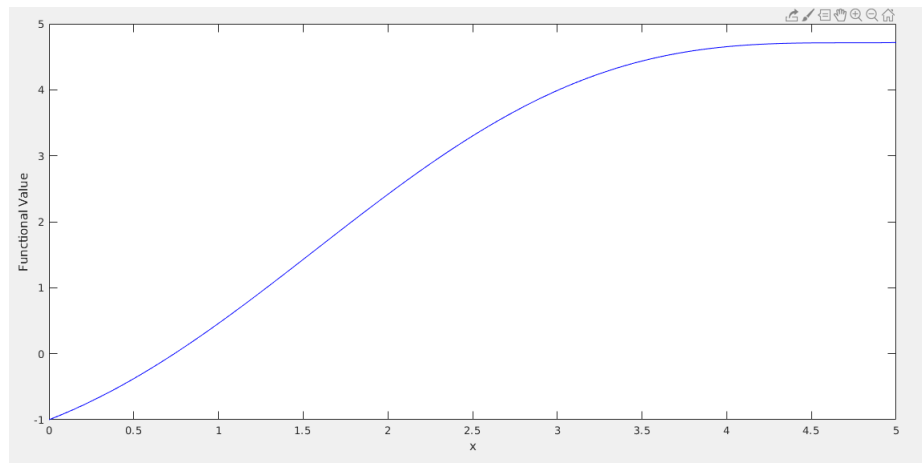


Figure1.4.1

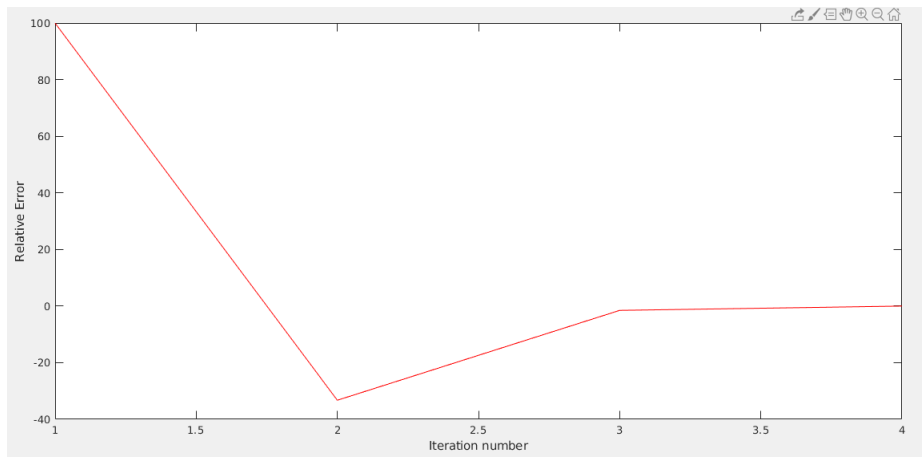


Figure1.4.2

5 Secant

OUTPUT:

The root is:7.390851121e-01

Terminated due to condition 1

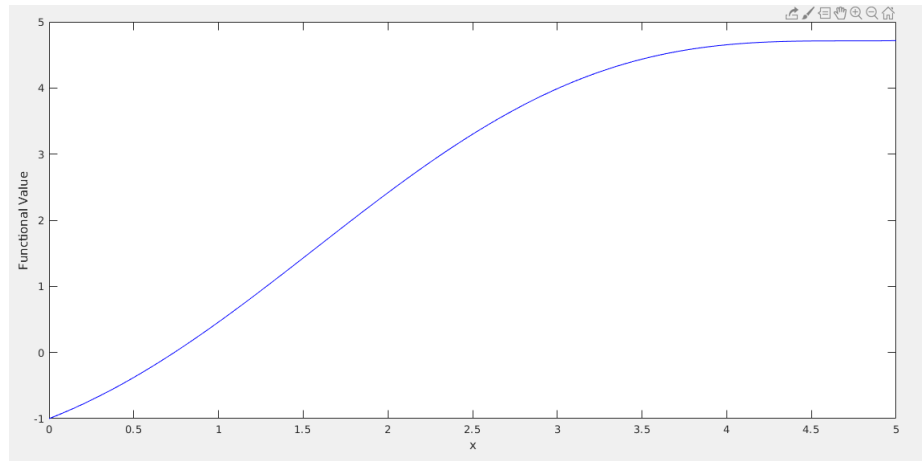


Figure1.5.1

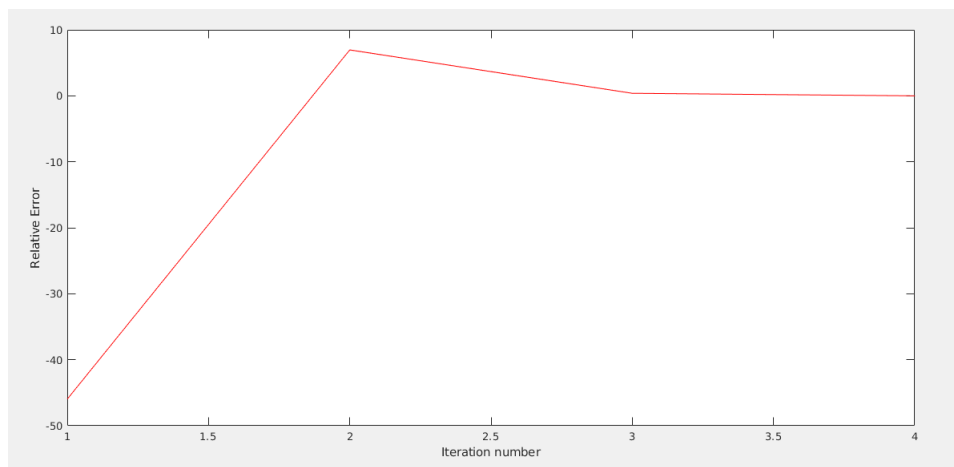


Figure1.5.2

$$B.f(x) = e^{-x} - x$$

6 Bisection

OUTPUT:

The root is:5.671386719e-01

Terminated due to condition 1

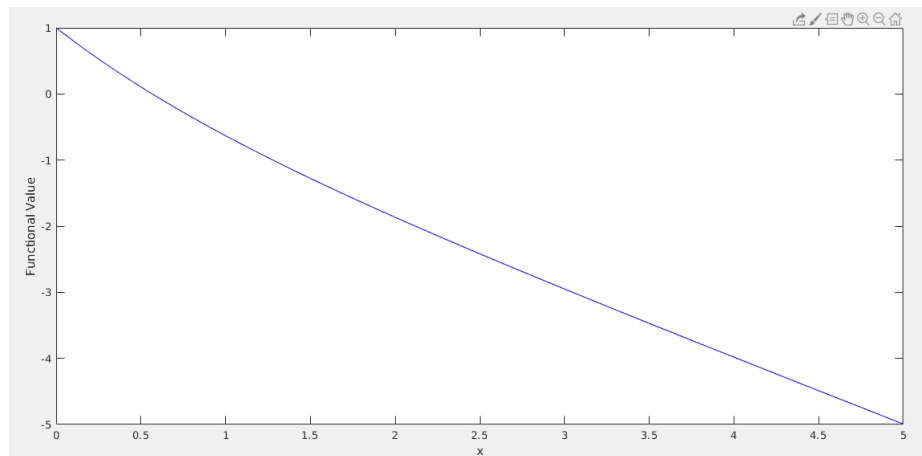


Figure2.1.1

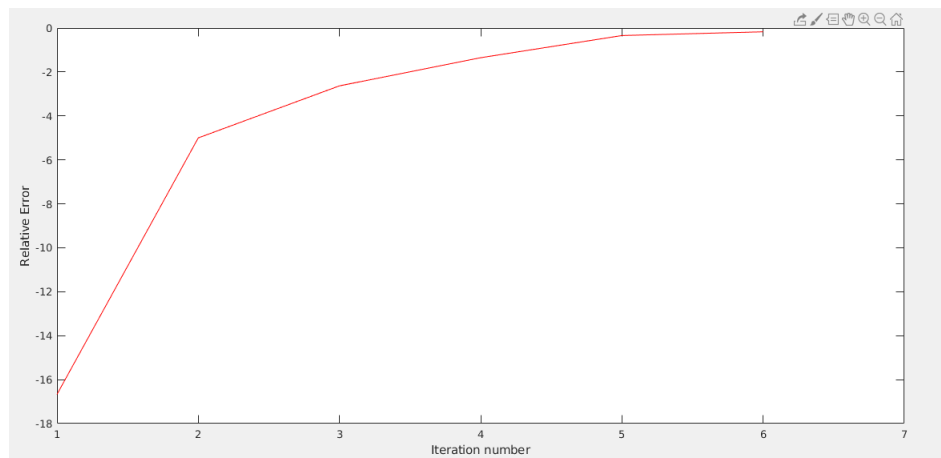


Figure2.1.2

7 Regula-Falsi

OUTPUT:

The root is:5.671502142e-01

Terminated due to condition 1

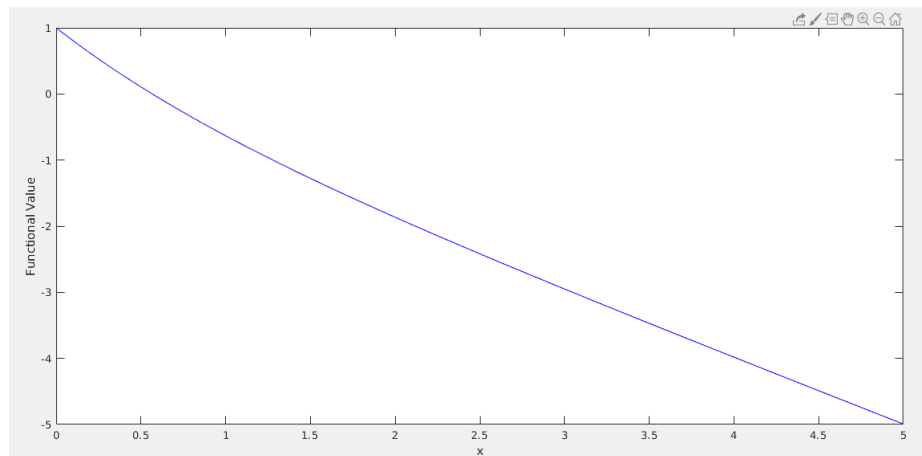


Figure2.2.1

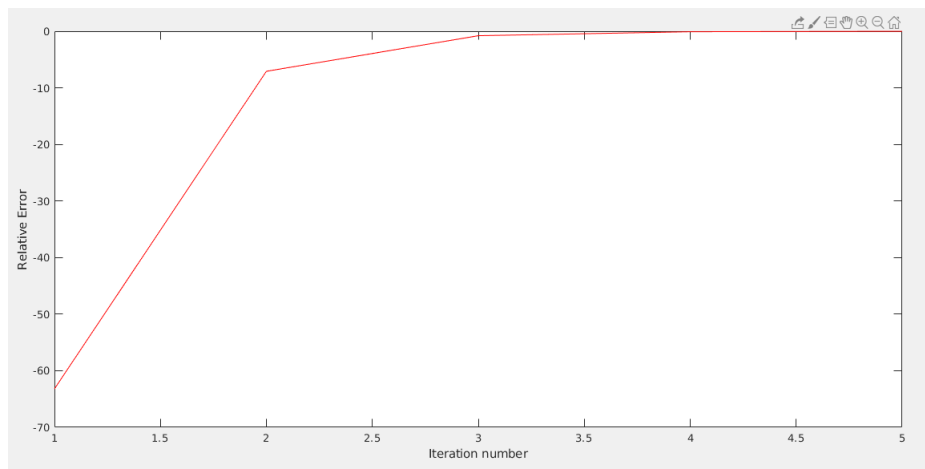


Figure2.2.2

8 Fixed Point

OUTPUT:

The root is:5.670678984e-01

Terminated due to condition 1

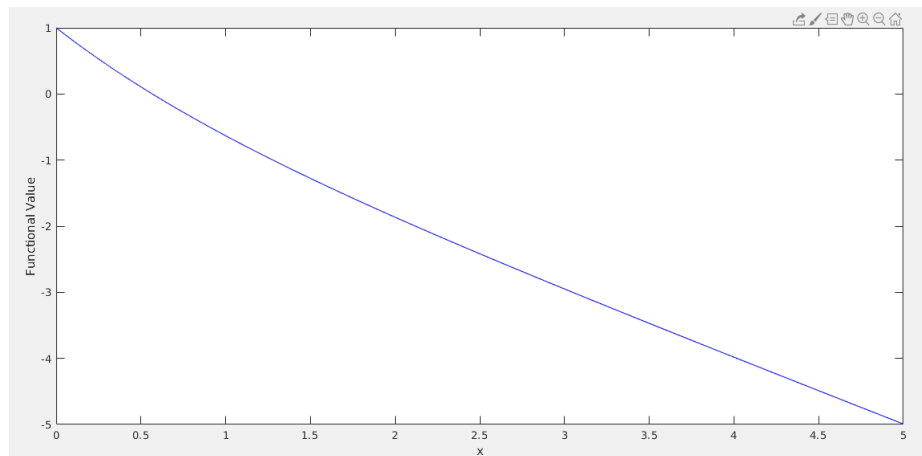


Figure2.3.1

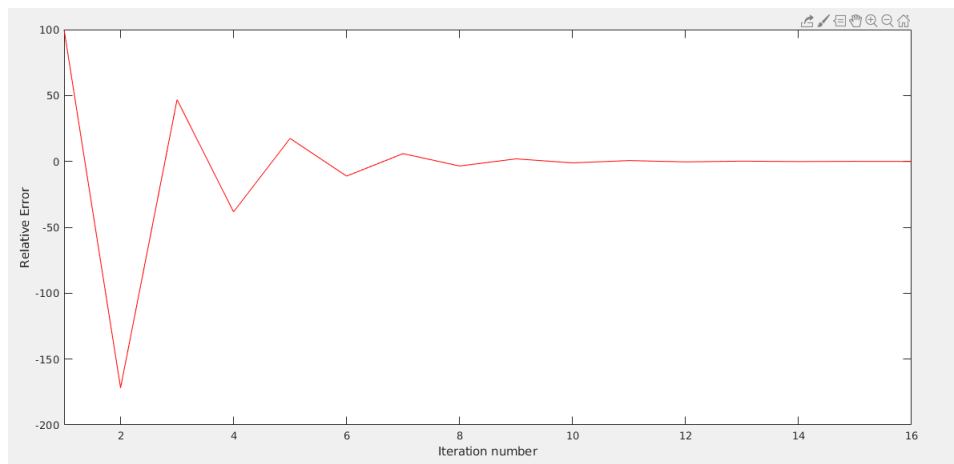


Figure2.3.2

9 Newton Raphson

OUTPUT:

The root is:5.671432904e-01

Terminated due to condition 1

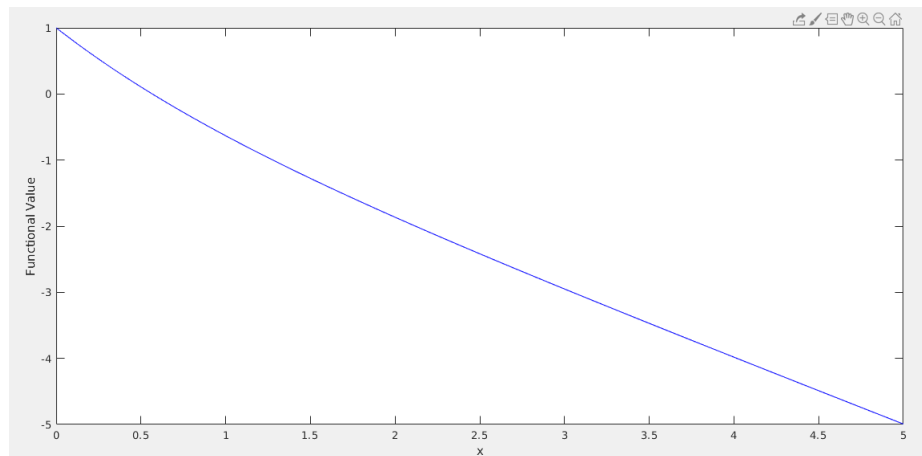


Figure2.4.1

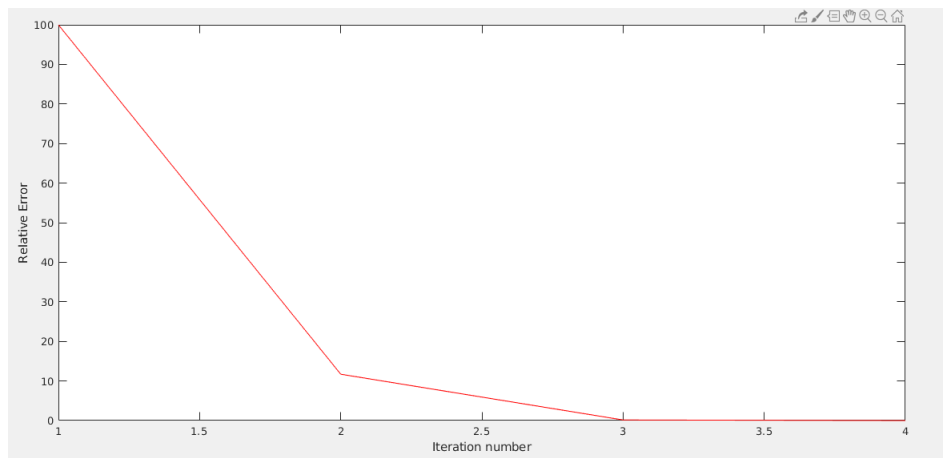


Figure2.4.2

10 Secant

OUTPUT:

The root is:5.671433066e-01

Terminated due to condition 1

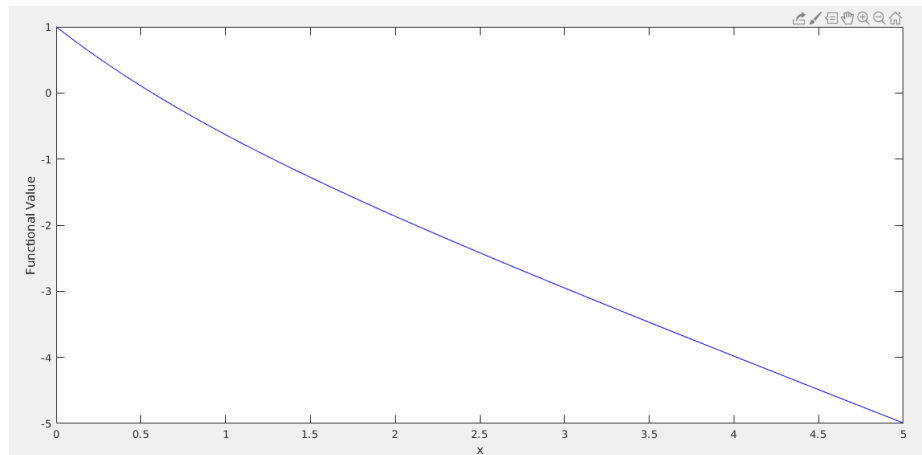


Figure2.5.1

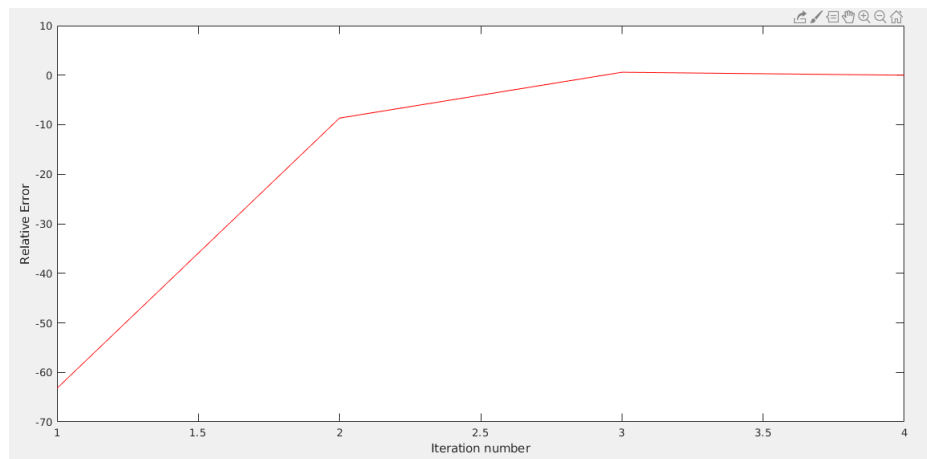


Figure2.5.2

$$C.f(x) = x^4 - 7.4x^3 + 20.44x^2 - 24.184x + 9.6448$$

11 Muller

OUTPUT:

The root is:8.000000000e-01

Terminated due to condition 1

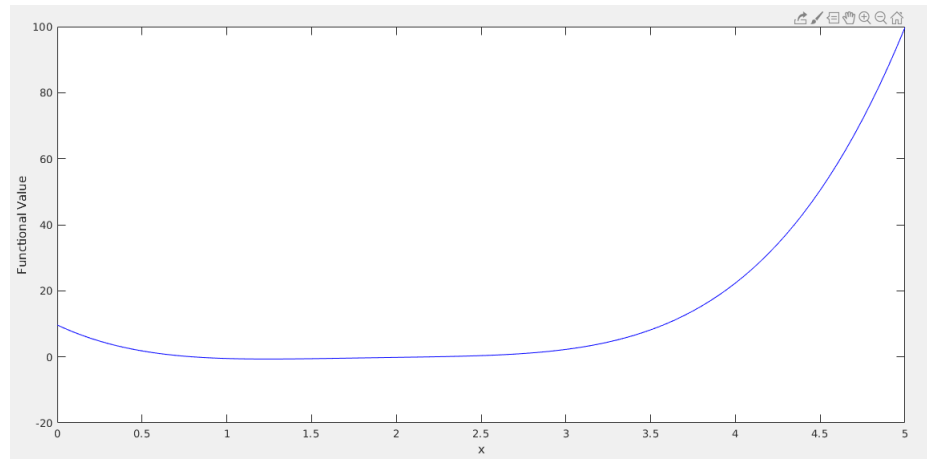


Figure3.1.1

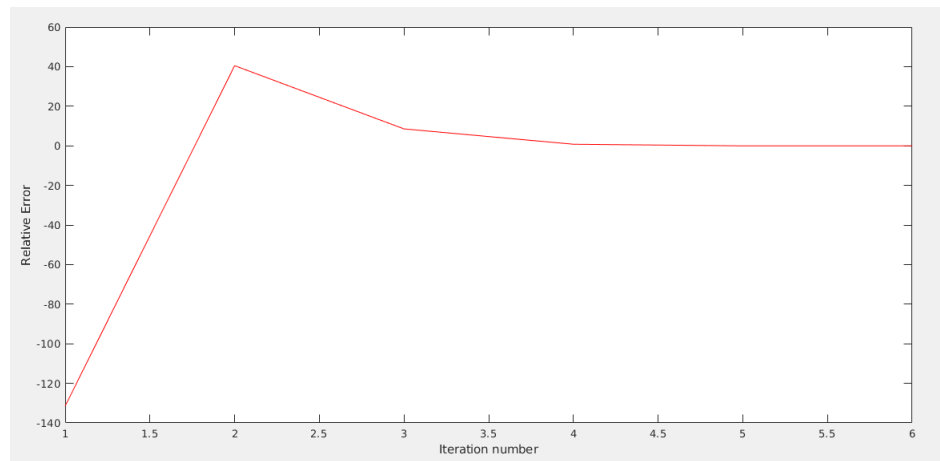


Figure3.1.2

12 Bairstow

$r=4$, $s=-5$

OUTPUT:

A root is: $2.199999994e+00 + 8.000000014e-01i$

A root is: $2.199999994e+00 - 8.000000014e-01i$

Terminated due to condition 1

A root is: $2.199918013e+00$

A root is: $8.000605340e-01$

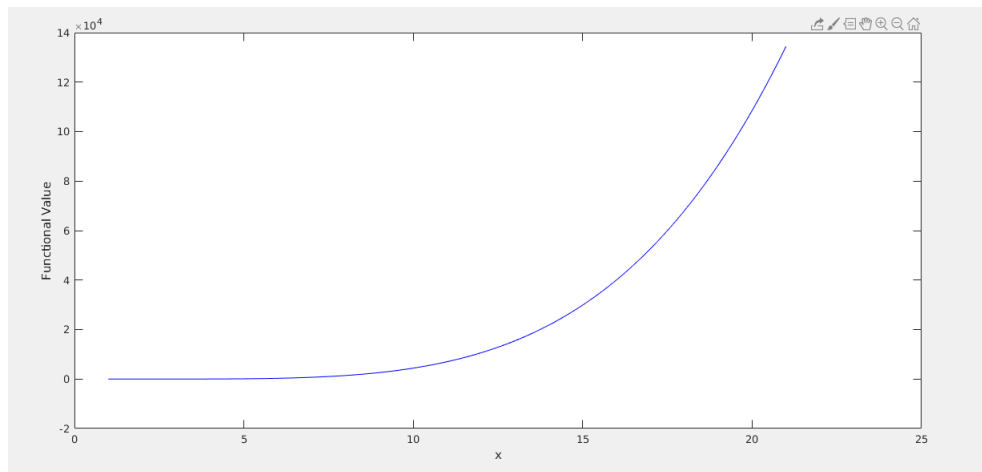


Figure3.2.1

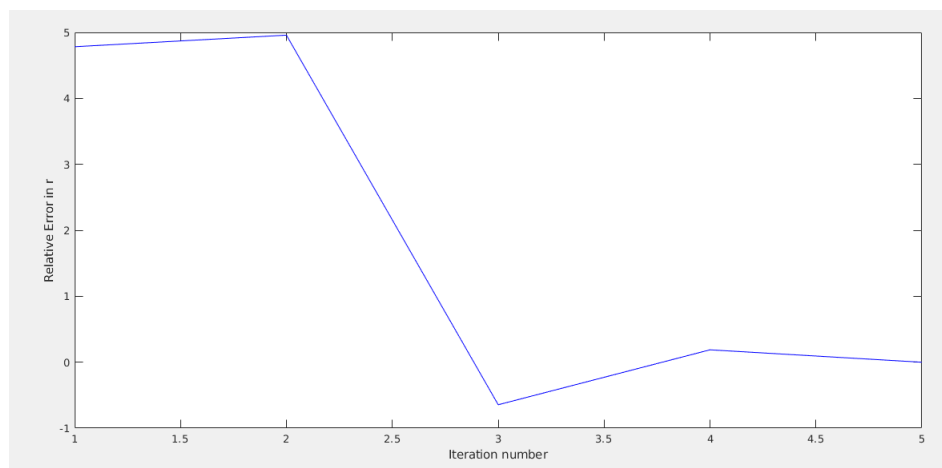


Figure3.2.2

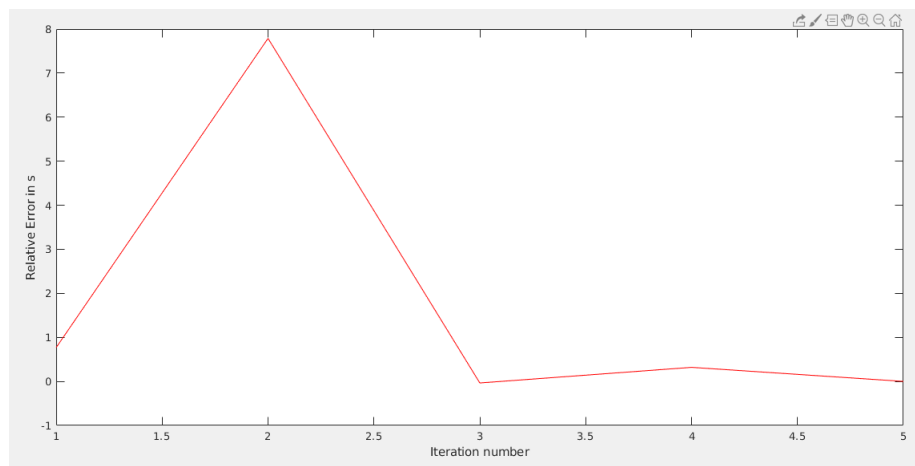


Figure3.2.3

$r=2$, $s=-2$

OUTPUT:

A root is:2.200000000e+00

A root is:8.000000000e-01

Terminated due to condition 1

A root is:2.199999978e+00+8.000000311e-01i

A root is:2.199999978e+00-8.000000311e-01i

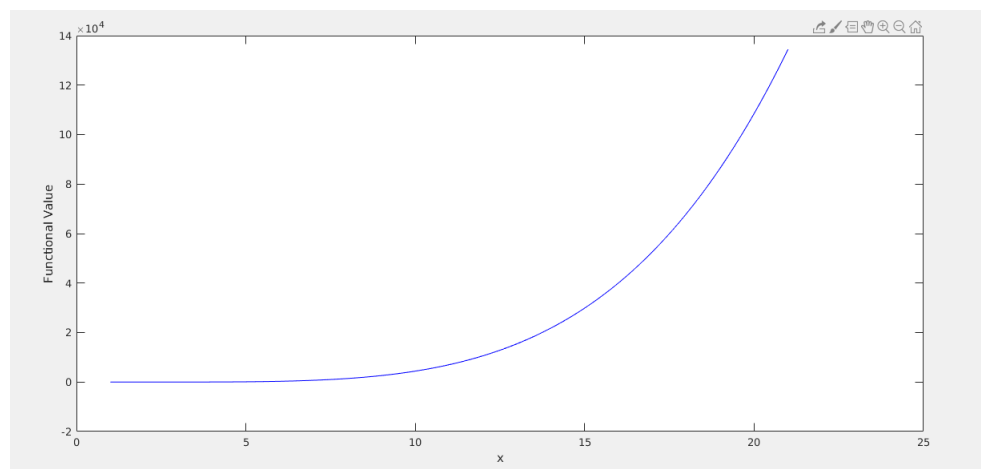


Figure3.3.1

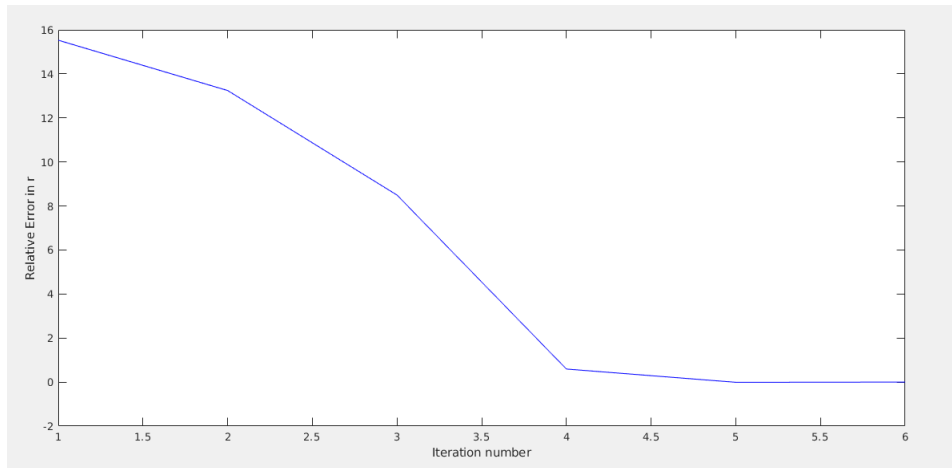


Figure3.3.2

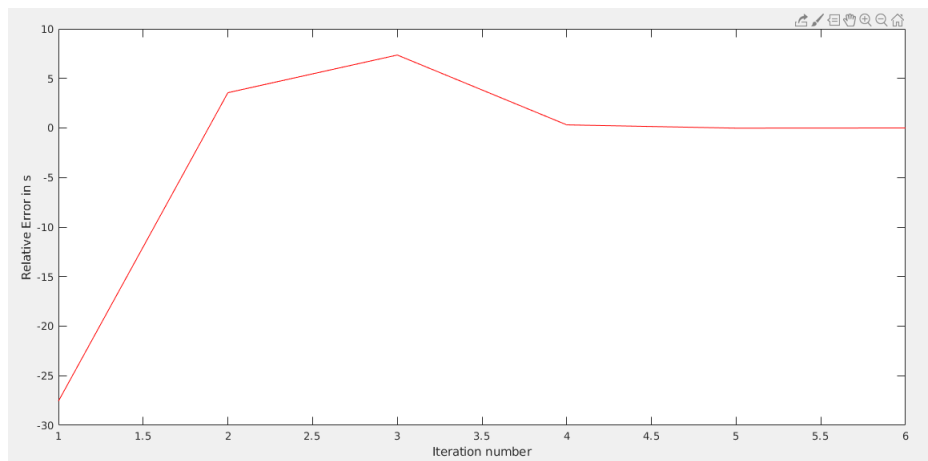


Figure3.3.3