OMKAR DESHPANDE | SE-CSE-1 | Roll No: 25

**OUTPUT**

**Case 1:** When a positive root exists:

**Enter the expression: 2x^3-10x^2-1x^0+0x^0**

**Initializated the polynomial successfully!**

**======MENU====**

**1) Enter the limits of the roots of given polynomial**

**2) Let the program calculate the limits of the roots.**

**Your choice: 2**

**|f(0.000000)=-1.000000 (-ive) |**

**|f(0.500000)=-3.250000 (-ive) |**

**|f(1.000000)=-9.000000 (-ive) |**

**|f(1.500000)=-16.750000 (-ive) |**

**|f(2.000000)=-25.000000 (-ive) |**

**|f(2.500000)=-32.250000 (-ive) |**

**|f(3.000000)=-37.000000 (-ive) |**

**|f(3.500000)=-37.750000 (-ive) |**

**|f(4.000000)=-33.000000 (-ive) |**

**|f(4.500000)=-21.250000 (-ive) |**

**|f(5.000000)=-1.000000 (-ive) |**

**|f(5.500000)=29.250000 (+ive) |**

**The roots lie between ( 5.000000 , 5.500000 )**

**Enter the allowed error and number of iterations: 0.00001 0**

**By default, 3 iterations will be executed.**

**| #No | r1 | r2 | x |f(x) | aer | ae |**

**|=======|=======|=======|=======|=======================|=======|=======|**

**| 1 |5.00000|5.50000|5.25000| 12.781250 (+ive) |5.25000|0.00001|**

**| 2 |5.00000|5.25000|5.12500| 5.566406 (+ive) |0.12500|0.00001|**

**| 3 |5.00000|5.12500|5.06250| 2.203613 (+ive) |0.06250|0.00001|**

**| 4 |5.00000|5.06250|5.03125| 0.582092 (+ive) |0.03125|0.00001|**

**| 5 |5.00000|5.03125|5.01562| -0.213867 (-ive) |0.01562|0.00001|**

**| 6 |5.01562|5.03125|5.02344| 0.182892 (+ive) |0.00781|0.00001|**

**| 7 |5.01562|5.02344|5.01953| -0.015793 (-ive) |0.00391|0.00001|**

**| 8 |5.01953|5.02344|5.02148| 0.083473 (+ive) |0.00195|0.00001|**

**| 9 |5.01953|5.02148|5.02051| 0.033829 (+ive) |0.00098|0.00001|**

**| 10 |5.01953|5.02051|5.02002| 0.009010 (+ive) |0.00049|0.00001|**

**| 11 |5.01953|5.02002|5.01978| -0.003391 (-ive) |0.00024|0.00001|**

**| 12 |5.01978|5.02002|5.01990| 0.002792 (+ive) |0.00012|0.00001|**

**| 13 |5.01978|5.01990|5.01984| -0.000282 (-ive) |0.00006|0.00001|**

**| 14 |5.01984|5.01990|5.01987| 0.001255 (+ive) |0.00003|0.00001|**

**| 15 |5.01984|5.01987|5.01985| 0.000477 (+ive) |0.00002|0.00001|**

**| 16 |5.01984|5.01985|5.01984| 0.000099 (+ive) |0.00001|0.00001| After completing 16 iterations, the root is: 5.019844**

* **#No: No. of iterations**
* **r1: Lower interval of root**
* **r2: Higher interval of root**
* **x: average value of r1 and r2**
* **aer: current error**
* **ae: accepted error by the user**