MUHAMMAD UMAR KHAN 10619

NC LAB#06

**Code:**

import cmath

fnctn= lambda x:x\*\*3-2\*x-5

fnctn1=lambda x:x\*\*2-3

fnctn2=lambda x:x\*\*3-x-1

fnctn3=lambda x:x\*\*3+1

defMULL\_METHOD(fnctn,x,xm1,xm2,epsilon):

i = 0

while(abs(fnctn(x)) > epsilon):

q = (x - xm1)/(xm1 - xm2)

a = q\*fnctn(x) - q\*(1+q)\*fnctn(xm1) + q\*\*2\*fnctn(xm2)

b = (2\*q + 1)\*fnctn(x) - (1+q)\*\*2\*fnctn(xm1) + q\*\*2\*fnctn(xm2) c = (1 + q)\*fnctn(x) r = x - (x - xm1)\*((2\*c)/(b + cmath.sqrt(b\*\*2 - 4\*a\*c)))

s = x - (x - xm1)\*((2\*c)/(b - cmath.sqrt(b\*\*2 - 4\*a\*c)))

if (abs(fnctn(r)) < abs(fnctn(s))): xp = r

else: xp = s

xm2 = xm1

xm1 = x

x = xp

i = i + 1

return xp,i

xm2 = 4

xm1 = 3

x = 2

epsilon = 0.00001

epsilon2 = 0.001

epsilon3 = 0.01

print("Serial Function Intervals epsilon iterations root") xp,i=MULL\_METHOD(fnctn,x,xm1,xm2,epsilon)

print("1 x\*\*3+4\*(x\*\*2)-10 ",x,",",xm1,",",xm2," ",epsilon," ",i," ",xp) xp,i=MULL\_METHOD(fnctn1,x,xm1,xm2,epsilon)

print("2 x\*\*2-3 ",x,",",xm1,",",xm2," ",epsilon," ",i," ",xp) xp,i=MULL\_METHOD(fnctn2,x,xm1,xm2,epsilon)

print("3 x\*\*3-x-1 ",x,",",xm1,",",xm2," ",epsilon," ",i," ",xp) xp,i=MULL\_METHOD(fnctn3,x,xm1,xm2,epsilon)

print("4 x\*\*3+1 ",x,",",xm1,",",xm2," ",epsilon," ",i," ",xp) xp,i=MULL\_METHOD(fnctn,x,xm1,xm2,epsilon2) print("1 x\*\*3+4\*(x\*\*2)-10 ",x,",",xm1,",",xm2," ",epsilon2," ",i," ",xp) xp,i=MULL\_METHOD(fnctn1,x,xm1,xm2,epsilon2)

print("2 x\*\*2-3 ",x,",",xm1,",",xm2," ",epsilon2," ",i," ",xp) xp,i=MULL\_METHOD(fnctn2,x,xm1,xm2,epsilon2)

print("3 x\*\*3-x-1 ",x,",",xm1,",",xm2," ",epsilon2," ",i," ",xp) xp,i=MULL\_METHOD(fnctn3,x,xm1,xm2,epsilon2)

print("4 x\*\*3+1 ",x,",",xm1,",",xm2," ",epsilon2," ",i," ",xp) xp,i=MULL\_METHOD(fnctn,x,xm1,xm2,epsilon3) print("1 x\*\*3+4\*(x\*\*2)-10 ",x,",",xm1,",",xm2," ",epsilon3," ",i," ",xp) xp,i=MULL\_METHOD(fnctn1,x,xm1,xm2,epsilon3)

print("2 x\*\*2-3 ",x,",",xm1,",",xm2," ",epsilon3," ",i," ",xp) xp,i=MULL\_METHOD(fnctn2,x,xm1,xm2,epsilon3)

print("3 x\*\*3-x-1 ",x,",",xm1,",",xm2," ",epsilon3," ",i," ",xp) xp,i=MULL\_METHOD(fnctn3,x,xm1,xm2,epsilon3)

print("4 x\*\*3+1 ",x,",",xm1,",",xm2," ",epsilon3," ",i," ",xp)

**OUTPUT:**

