**Lab Task 3**

**Numerical Computing Lab(105127)**

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Q1:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **S#** | **Functions** | **Starting Interval** | **Tolerance** | **No. Of Iterations** | **Root** |
| 1 | Cos(x)-1.3x = 0 | 0.0001 - 3 | 0.01 | 1 | 0.5614157176078265 |
| 0.0001 - 3 | 0.001 | 6 | 0.5614157176078265 |
| 0.0001 - 3 | 0.0001 | 6 | 0.5614157176078265 |
| 2 | xCos(x)-2x2+3x-1=0 | 1.1-2.1 - 2.5 | 0.01 | 1 | -1.2578-2.0498j |
| 1.1-2.1 - 2.5 | 0.001 | 1 | -1.2578-2.0498j |
| 1.1-2.1 - 2.5 | 0.0001 | 1 | -1.2578-2.0498j |
| 3 | 2xCos(2x)-(x+1)2=0 | -3 - 4 | 0.01 | 6 | -1.0870630814266813 |
| -3 - 4 | 0.001 | 6 | -1.0870630814266813 |
| -3 - 4 | 0.0001 | 6 | -1.0870630814266813 |

Q2:

print("Iter----a----f(a)----b----f(b)----m----RE----PRE")

import math

def f(y):

pi=22/7

j = y\*(180/pi)

return y\*math.cos(j)-2\*y\*\*2+3\*y-1

def rf(a,b,tol):

niter=0

moldd = 0

pre = 0

re = 0

while(abs(a-b)>=tol and niter <= 5):

m=(a\*f(b)-b\*f(a))/(f(b)-f(a))

prod1=f(a)\*f(m)

prod2=f(b)\*f(m)

if prod1<0:

b=m

elif prod2<0:

a=m

niter+=1

if(niter > 1):

re = abs(m-moldd)

pre = abs(((moldd/m)\*100)-100)

moldd = m

print(niter,"||||",a,"||||",f(a),"||||",b,"||||",f(b),"||||",m,"||||",re,"||||",pre,"%")

return m,niter

answer,n=rf(1,2,0.01)

print(answer,n)

