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/*WAP to find solution of Non-Linear equations by Newton-Raphson Method.*/
#include <iostream>
#include <cmath>
#include <iomanip>
#include <cstring>
#define pi 3.14159265358979323846264338327950288419716939937510
#define e 2.71828182845904523536028747135266249775724709369995
using namespace std;
double x_1,y_1;
inline void maths_function(double &x)
{
    double y,dy;
    y = sin(x)-pow(e,-x);//Put your function here
    dy = cos(x)+pow(e,-x);//Put your function derivative here
    cout<<"\t\t"<<right<<setw(9)<<setprecision(9)<<x;
    x_1 = x-y/dy;
    y_1 = sin(x_1)-pow(e,-x_1);//Put your function here
    cout<<"\t\t"<<right<<setw(9)<<setprecision(9)<<y;
    cout<<"\t\t"<<right<<setw(9)<<setprecision(9)<<dy;
    cout<<"\t\t"<<right<<setw(9)<<setprecision(9)<<x_1;
    cout<<"\t\t\t"<<right<<setw(9)<<setprecision(9)<<y_1;
}
int main()
{
    int k,error,counter;
    cout.precision(9);
    while(1)
    {
        counter=0;
        cout<<"\n\t\tNEWTON-RAPHSON METHOD\n\n";
        cout<<"\nEnter your initial guess (a) : ";
        cin>>x_1;
        cout<<"\nEnter tolerance ( $10^{-k}$ )\n";
        cout<<"\nEnter k: ";
        cin>>k;

        cout<<"\n\n*****"
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*****
*****\n\n";
    error=10;
    cout<<" SN\t\t a(n)"<<"\t\t\t f(a(n))"<<"\t\t f'(a(n))"<<"\t a(n+1) = a(n) -
f(a(n))/f'(a(n))"<<"\t f(a(n+1))\n\n";
    while (error>9)
    {
        cout<<" "<<++counter;
        maths_function(x_1);
        cout<<endl<<endl;
        error = (int)trunc(abs(y_1*pow(10,k)));//error is in order of 10^k
    }

    cout<<"\n\n*****
*****
*****\n\n";
}
return 0;
}

```