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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
   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)<<x;
   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"<<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\t
a(n+1)"<<"\t\t\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;
}
```