//program for successive approximation method

#include "stdafx.h"

#include <iostream>

using namespace std;

#include <math.h>

//#define f(x) (x\*x\*x\*x-x-10)

//#define g(x) (pow((x+10),0.25))

#define f(x) (x\*x\*x+x\*x-1)

#define g(x) (pow((x+1),-0.5))

int a, b, x=0;

float x0=0, xn=0;

int main()

{ if(f(x)<0.0)

{ while(x<30)

{ if(f(x)>0.0)

{ b = x--;

a = x;

break;

}

x++;

}

cout << " Interval : [" << a << "," << b << "]";

x0 = (float)(a + b) / 2;

for(int i=0;i<30;i++)

{ xn = g(x0);

if (xn == x0)

break;

x0 = xn;

cout << "\n Step " << i+1 << "\t Root=" << xn;

}

}

else

{ while(x<30)

{ if(f(x)<0.0)

{ a = x--;

b = x;

break;

}

x++;

}

cout << " Interval : [" << a << "," << b << "]";

x0 = (float)(a + b) / 2;

for (int i = 0; i<30; i++)

{ xn = g(x0);

if (xn == x0)

break;

x0 = xn;

cout << "\n Step " << i + 1 << "\t Root=" << xn;

}

}

return 0;

}

