#include <iostream>
#include <cmath>
#include <iomanip>
using namespace std;

#define TOL 1.0e-4

double f1(double p){ return (p*p - 25.0); }
double f2(double p){ return (2.0*p); }

int main(){
    double x = 2.0, err;
    cout << setprecision(3) << fixed;
    do{
        err = f1(x)/f2(x);
        cout << setw(5) << x << setw(7) << err << endl;
        x = x - err;
        if(fabs(err)<TOL) break;
    }while(1);
}

# include <iostream>
# include <vector>
# include <iomanip>
using namespace std;

float step(int p){
    float h;
    switch(p){
        case 1: h = 0.50; break;
        case 2: h = 0.10; break;
        case 3: h = 0.05; break;
        default: h = 1.00;
    }
    return h;
}

int main(){
    vector<float> x(6);
    for(unsigned int j=0; j<x.size(); j++)
        x[j] = step(j)/(1+j);
    x.pop_back();
    x.insert(x.begin()+3, 0.8);
    x.erase (x.begin()+2);
    x.push_back(1.5);
    for(unsigned int k=0; k<x.size(); k++)
        cout << setw(3) << k << setprecision(2) << fixed << setw(8) << x[k] << endl;
}
[20] Question 3
(a) Consider a file `kelvin.tmp` contains 100 lines of temperature values in Kelvin.

Write a program that reads the data from the file and outputs the mean temperature to the screen.

(b) Assume that the program is saved as `read.cpp`. Write down how to compile and run `read.cpp` under Linux operating system using `g++` compiler.

Compile: 

run: 

[20] Question 4
(a) Complete the body of the function given right such that the function returns the sum of first `n` terms of the following series

\[ 1 + \frac{1}{2} + \frac{1}{5} + \frac{1}{14} + \frac{1}{41} + \ldots \]

\[
\begin{align*}
\text{#include <iostream> } \\
\text{using namespace std;} \\
\text{double sum(int n)\{} \\
\text{ // write your code here} \\
\text{\}} \\
\text{int main() \{} \\
\text{ cout << sum(1) + sum(5) + sum(10) << endl; } \\
\text{return 0;} \\
\text{\}}
\end{align*}
\]

(b) write down the output of the program
In x-y plane, general equation of a circle of radius \( r \) is given by:

\[
(x - a)^2 + (y - b)^2 = r^2.
\]

where \((a, b)\) is the center coordinates of the circle. Implement a \texttt{Circle} class. Each object of this class will represent a circle, storing its radius \( r \) and \( a \) and \( b \) coordinates of its center as doubles.

The class must include

- a default constructor function whose prototype is
  \texttt{Circle(double radius, double centerX, double centerY);}
  to set (initialize) radius and center coordinates.
- a member function named \texttt{double area()} that returns the area.
- a member function named \texttt{double circ()} that returns circumference.
- a member function named \texttt{int isin(double x, double y);}
  that returns 1 if the given point \((x, y)\) is inside the circle and returns 0 otherwise.

Write down ONLY the class declaration and class members. NO MAIN PROGRAM IS REQUIRED.