Problem 1

Question:

Use a while loop to find the smallest integer n such that n\*n is greater than 12000.

Program code

#include<iostream>

#include <math.h>

using namespace std;

int main()

{

int n,sum;

n=1;

sum=1;

while (sum<=12000)

{

n=n+1;

sum=n\*n;

}

cout<<"the smallest integer n such that n\*n is greater than 12000 is :"<<n<<endl;

return 0;

}

Program analysis

Use while to do a loop. We need to pay attention to the position of the statement “n=n+1”

Program result

Question2:

You can approximate PI by using the following series:

PI=4\*(1-1/3+1/5-1/7+1/9-1/11+…+(-1)(i+1)/(2\*i-1))

Write a program that displays the PI value for i=10000, 20000, …., and 100000

Program code

#include <math.h>

#include <iostream>

using namespace std;

void main()

{

int i,j;float pi;pi=0;

for (i=1;i<=10;i=i+1)

{ for (j=1;j<=i\*10000;j=j+2)

pi=pi+1.0/j\*pow(-1,(j+3)/2);

cout<<pi\*4<<endl;

pi=0;

}

}

Program analysis

Using two if loop to calculate the pi;

Using power formal to get the approximate number.

Program result

Question3:

A square is divided into four smaller regions as shown in (a). If you throw a dart into the square 1000000 times, what is the probability for a dart to fall into an odd-number region? Write a program to simulate the process and display the result.

**Hint: Place the center of the square in the center of a coordinate system, as shown in (b). Randomly generate a point in the square and count the number of times for a point to fall into an odd-numbered region. You can use srand function to generate a random number.**)

Program code

#include<iostream>

#include <math.h>

#include <ctime>

using namespace std;

int main()

{

int sum,i,x,y;

sum=0;srand(time(0));

for (i=1;i<=1000;i=i+1)

{

x=(-rand()%20001)+10000;

y=(-rand()%20001)+10000;

if (x<0) sum=sum+1 ;

else if (y>0 && ((x+y)<10000)) sum=sum+1;

cout<<x<<" "<<y<<" "<<sum<<endl;

}

cout<<sum\*1.0/1000<<endl;

return 0;

}

Program analysis

Program result