



# Pythagorean Triple



by amititkgp

Problem

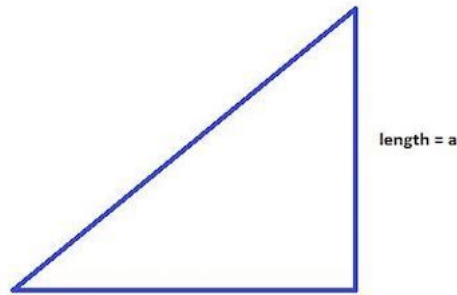
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Leaderboard

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A *Pythagorean triple* consists of three positive integers  $a$ ,  $b$ , and  $c$  such that  $a^2 + b^2 = c^2$ . Such a triple is commonly written as  $(a, b, c)$ . This term comes from the [Pythagorean theorem](#), which says that a Pythagorean Triple will be the lengths of the sides of a [right-angled triangle](#).

You have been given an integer  $a$  which represents the length of one of [cathetus](#) of a right-angle triangle.



You need to find the lengths of the remaining sides. There may be multiple possible answers; any one will be accepted.

Hints:

- Every odd number  $2k + 1$  can be represented as  $(k + 1)^2 - k^2$ .
- If  $m$  and  $n$  are integers and  $m > n$ , then  $(m^2 - n^2)^2 + (2mn)^2 = (m^2 + n^2)^2$ .

## Input Format

The first line contains an integer  $a$  denoting the length of one of cathetus of the right-angled triangle.

## Constraints

- $5 \leq a < 10^9$

## Output Format

A single line containing the possible values of  $a$ ,  $b$  and  $c$ . You may print them in any order.

## Sample Input 0

5

## Sample Output 0

5 12 13

## Explanation 0

We can see that the triple **(5, 12, 13)** is a pythagorean triple:

$$5^2 + 12^2 = 13^2$$

f t in

Contest ends in 10 hours

Submissions: 2686

Max Score: 20

Difficulty: Easy

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Java 7

```

1 import java.io.*;
2 import java.util.*;
3 import java.text.*;
4 import java.math.*;
5 import java.util.regex.*;
6
7 public class Solution {
8
9     static BigInteger[] pythagoreanTriple(int a){
10         // Complete this function
11         BigInteger[] res = new BigInteger[3];
12
13         if(a%2==0) {
14             BigInteger ab = BigInteger.valueOf(a);
15
16             BigInteger p = ab.multiply(ab).divide(BigInteger.valueOf(4));
17             //System.out.println(ab.multiply(ab).divide(BigInteger.valueOf(4)));
18             res[0] = BigInteger.valueOf(a);
19             res[1] = p.subtract(BigInteger.ONE);
20             res[2] = p.add(BigInteger.ONE);
21         }else{
22             BigInteger ab = BigInteger.valueOf(a);
23             BigInteger p = ab.multiply(ab).divide(BigInteger.valueOf(2)) ;
24             res[0] = BigInteger.valueOf(a);
25             res[1] = p ;
26             res[2] = p.add(BigInteger.ONE);
27         }
28         Arrays.sort(res);
29         return res;
30     }
31
32     public static void main(String[] args) {
33         Scanner in = new Scanner(System.in);
34         int a = in.nextInt();
35         BigInteger[] triple = pythagoreanTriple(a);
36         for (int i = 0; i < triple.length; i++) {
37             System.out.print(triple[i] + (i != triple.length - 1 ? " " : ""));
38         }
39         System.out.println("");
40
41     }
42 }
43
44

```

Line: 35 Col: 19

Upload Code as File ☐ Test against custom input

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