

# Competitive Programming SS24

Submit until end of contest



## Problem: Area 50 (1 second timelimit)

NASA has built a top-secret underground laboratory to research extraterrestrial life as well as other things that no one will ever know. They have made a major breakthrough: the planet where all life began was found. Quickly, all the engineers came together and built the most beautiful rocket ever seen (or never seen).

But there is one big problem: the rocket is located underground, and it needs clear skies to take off.

No one has thought about this problem, but you are the greatest mathematician of all time, ready to find a solution. You have the idea to cut a square hole in the top of the base to launch the rocket. The rocket can be represented by a circle with known coordinates of the center and radius. The hole should be as small as possible, since nobody should be able to find the top-secret and perfectly thought-out underground laboratory. In addition, only integers can be used for the corner coordinates due to the accuracy of the measuring devices.

Show your skills and calculate the coordinates of the corners for the square hole.

**Input** The input consists of:

- One line containing two integers  $x$  and  $y$  ( $-10^9 \leq x, y \leq 10^9$ ), the coordinates of the center of the circle.
- One line containing one integer  $r$  ( $1 \leq r \leq 10^9$ ), the radius of the circle.

**Output** Output four lines, each line containing two integers, representing the  $x$ - and  $y$ -coordinates of one of the corners of the square. The coordinates should be printed in either clockwise or counter-clockwise order.

If there are multiple valid solutions, you may output any one of them.

### Sample Input 1

```
-3 6
5
```

### Sample Output 1

```
-10 7
-2 13
4 5
-4 -1
```

**Sample Input 2**

```
0 0
10
```

**Sample Output 2**

```
-14 -2
-2 14
14 2
2 -14
```