

As Jacques-Édouard really likes birthday cakes, he celebrates his birthday every hour, instead of every year. His friends ordered him a round cake from a famous pastry shop, and placed candles on its top surface. The number of candles equals the age of Jacques-Édouard in hours. As a result, there is a huge amount of candles burning on the top of the cake. Jacques-Édouard wants to blow all the candles out in one single breath.

You can think of the flames of the candles as being points in the same plane, all within a disk of radius  $R$  (in nanometers) centered at the origin. On that same plane, the air blown by Jacques-Édouard follows a trajectory that can be described by a straight strip of width  $W$ , which comprises the area between two parallel lines at distance  $W$ , the lines themselves being included in that area. What is the minimum width  $W$  such that Jacques-Édouard can blow all the candles out if he chooses the best orientation to blow?



## Input

The input file contains several test cases, each of them as described below.

The first line consists of the integers  $N$  and  $R$ , separated with a space, where  $N$  is Jacques-Édouard's age in hours. Then  $N$  lines follow, each of them consisting of the two integer coordinates  $x_i$  and  $y_i$  of the  $i$ -th candle in nanometers, separated with a space.

## Limits

- $3 \leq N \leq 2 \cdot 10^5$ ;
- $10 \leq R \leq 2 \cdot 10^8$ ;
- for  $1 \leq i \leq N$ ,  $x_i^2 + y_i^2 \leq R^2$ ;
- all points have distinct coordinates.

## Output

For each test case, the output must follow the description below.

Print the value  $W$  as a floating point number. An additive or multiplicative error of  $10^{-5}$  is tolerated: if  $y$  is the answer, any number either within  $[y - 10^{-5}; y + 10^{-5}]$  or within  $[(1 - 10^{-5})y; (1 + 10^{-5})y]$  is accepted.

## Sample Input

```
3 10
0 0
10 0
0 10
```

## Sample Output

```
7.0710678118654755
```