K: Blowing Candles



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 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 ith candle in nanometers, separated with a space.

Limits

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

Output

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

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3 10
0 0
10 0
0 10
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Sample Output

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7.0710678118654755
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