

# Fence

Input file:            **standard input**  
Output file:           **standard output**  
Time limit:            2 seconds  
Memory limit:         512 megabytes

Donald owns a nice small house in Manhattan. Due to recent elections it is important to protect yourself from the potential public unrest, so Donald has decided to build a fence around his house.

Donald's house can be represented as a polygon on the plane, with all the coordinates being integers. Moreover, all of his house corners are exactly 90 deg, and each wall is parallel to either east-west or north-south axis. Donald wants to build a fence so that the house is completely inside of it and that the fence is not too close to the house. More precisely, Donald wants to build a fence in such way that Manhattan distance between any point of the fence and any point of the house is at least  $l$ .

Recall that Manhattan distance between points  $(x_1, y_1)$  and  $(x_2, y_2)$  is  $|x_1 - x_2| + |y_1 - y_2|$ .

Donald wants to minimize building costs, so he asks you to find the smallest possible length of the fence.

## Input

The first line contains integers  $n$  and  $l$  ( $4 \leq n \leq 100\,000$ ,  $0 \leq l \leq 10^8$ ).

Each of the next  $n$  lines contains integers  $x_i, y_i$  ( $|x_i|, |y_i| \leq 10^8$ ), describing the border of the house in clockwise or counterclockwise order.

It's guaranteed that the house is non-degenerate, doesn't contain any self-intersections (no two segments intersect except the neighboring segments having a common end), no two points coincide, all the house walls are either vertical or horizontal.

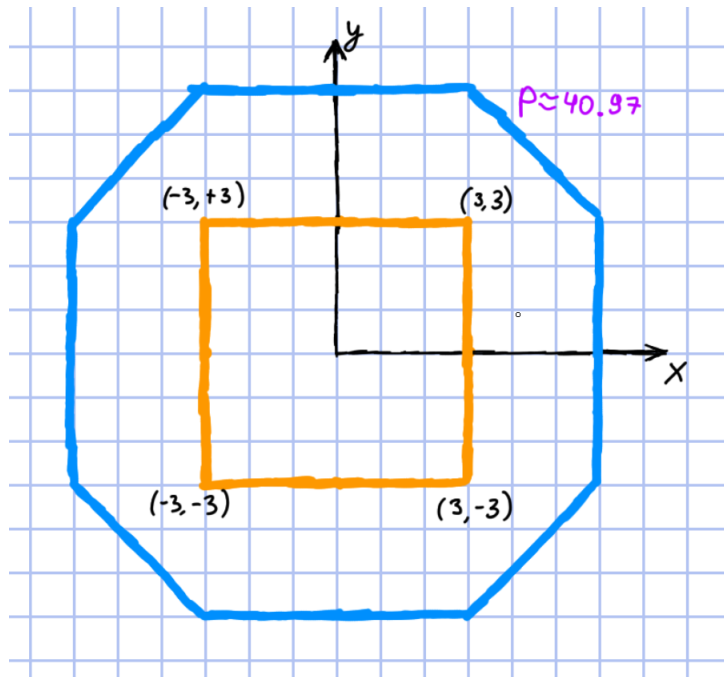
## Output

Print a single real value, the smallest possible length of the fence. Your answer will be considered correct if it's absolute or relative error will be at most  $10^{-6}$ .

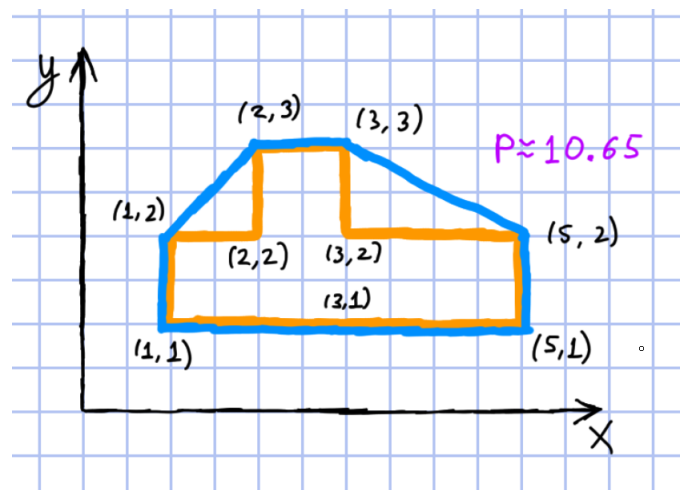
## Examples

standard input	standard output
4 3 -3 -3 -3 3 3 3 3 -3	40.9705627485
9 0 1 1 3 1 5 1 5 2 3 2 3 3 2 3 2 2 1 2	10.6502815399

## Explanations



Example 1, the house is shown inside in orange, and the optimal fence is shown outside in blue.



Example 2, the house is shown inside in orange, and the optimal fence is shown outside in blue.