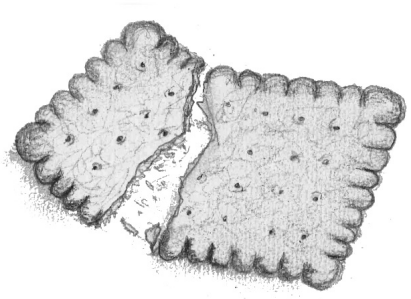
Problem B
Breaking Biscuits



This year, Walter's workplace resolved to try something radically different: they're going to change the weekly order of biscuits for the break room to a whole other brand.

Biscuits come in many shapes and sizes, but the particular brand they settled on has two special qualities:

- It is completely planar (two-dimensional);
- It is perfectly polygon-shaped.

However, disaster struck immediately: the available mugs in the break room are too narrow for Walter to be able to dunk these new biscuits into, no matter what combination of rotations along the three axes he tries.

There is only one thing for it: Walter will need to order another mug.

Before taking this drastic step, it is vital to know how wide the diameter of this mug will need to be in order to succesfully accommodate a (possibly rotated) biscuit of the new brand.

Input

- One line containing an integer N ($3 \leq B \leq 100$), the number of vertices in the biscuit.
- Each of the following N lines contains two space-separated integers X_i and Y_i ($-10^5 \leq X_i, Y_i \leq 10^5$), the coordinates of the i-th vertex.

Vertices are always given in anti-clockwise order. Also, as anyone can tell you, biscuits never self-intersect and always have positive area.

Output

Output the minimum possible diameter of the new mug, in order that it can fit the new kind of biscuit fully inside in at least one orientation. The output must be accurate to an absolute or relative error of at most 10^{-6}.

Sample Input 1	Sample Output 1
4 0 0 5 0 5 2 0 2	2.0

Sample Input 2

```
6
81444 14017
80944 13517
81127 12834
81810 12651
82310 13151
82127 13834
```

Sample Output 2

```
1224.7089450046291
```

Sample Input 3

```
8
197 239
208 246
221 241
250 254
220 265
211 258
198 268
163 256
```

Sample Output 3

```
28.816782
```