4075 Close To Perfection

Mr. Skywind is a completist. He wants to draw a most prefect shape with some point. He know that circle is a perfect shape, because among of all shapes with the same circumference, area enclosed by circle is the largest one. Strictly, for each shape, a "perfect ratio" is defined:

$$pr(S) = len^2(S)/area(S)$$

Here, $len(S)$ is the circumference of the shape S, $area(S)$ is the area enclosed by shape S. The value of this ratio only depends on the shape. It doesn't change under similarity transformation. One can prove that $pr(circle) = 4 * \pi$ is the minimal among all possible shapes.

Your task is to find a polygon with the minimal pr in a given set of points .

Input

The first line of each input case contains an integer n ($3 \leq n \leq 20$), the number of following coordinators.

There are two integers x and y in each of the following n lines, indicating the coordinators of one point. $0 \leq x, y \leq 10000$.

No more than 10 input cases will be given.

Output

For each input case, output the minimal pr, rounded to the 4th decimal place.

Sample Input

```
4
0  0
0  1
1  0
1  1
```

Sample Output

```
16.0000
```