

J. Birthday bash

Difficulty: Demon

Time: 5 s

Memory: 1024 MB

by robertyl

Today is Alice's birthday! She invited you and her $n - 2$ other friends to her birthday bash.

The birthday cake is a convex polygon with n sides. After they sing Happy Birthday, the cake is cut as follows: a point P is chosen uniformly at random in the interior of the cake and n cuts are made from P to the corners of the cake, creating n triangular slices. Since you and Alice are nice, you let your $n - 2$ friends first take a slice, then you take a slice, and Alice gets the last one.

If everyone greedily takes cake slices by area, what is the expected area of your slice?

Input

The first line contains a single integer n ($3 \leq n \leq 200$), the number of sides.

The i -th of the following n lines contains two integers x_i and y_i ($-10^3 \leq x_i, y_i \leq 10^3$), the coordinates of the i -th vertex of the polygon.

The vertices are given in counterclockwise order. The polygon is convex: all internal angles of the polygon are strictly smaller than π .

Output

Print one real number: the expected area of your slice of cake.

Your answer will be considered correct if its absolute or relative error does not exceed 10^{-6} .

Sample 1

Input

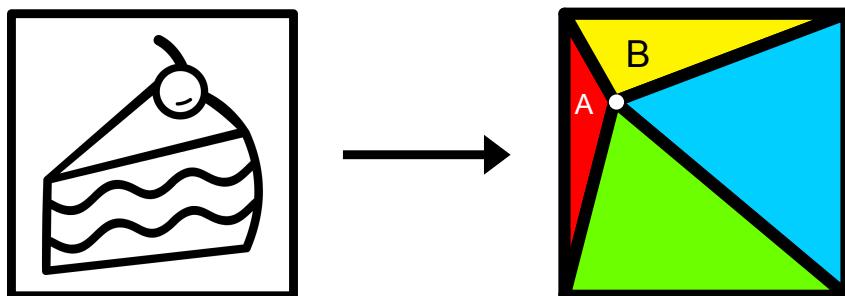
```
4
0 0
1 0
1 1
0 1
```

Output

```
0.166666637
```

Explanation

In the sample, we have a 1×1 square. For instance, if the white dot below is chosen as the point, Alice gets the smallest slice A and you receive B . It can be shown that over all points inside the square, the average area of the second-smallest slice is $1/6$.



There is another sample on the next page.

Sample 2

Input

```
10
-43 33
-35 -39
32 -41
46 -12
50 30
50 34
49 38
42 49
37 49
-6 44
```

Output

```
95.718821997
```