Problem L. Prism Palace

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	256 megabytes

Little D wants to build a prism palace using two parallel planes $A(z = 0)$ and $B(z = 10^9)$ that she has. To finish her build, she borrows a **convex** polygon P consisting of n points from Little N. She puts two identical copies of P on the two planes, one on each. The two polygons must be identical to P and must be able to coincide by translating the polygon on A along some vector $(d_x, d_y, 10^9)$ to the polygon on B without rotating.

Together, the two polygons form a prism-shaped palace between them. Let the projection area of the prism's sides perpendicularly onto plane A be $S_1, S_2, \cdots S_n$, and the probability of the multiset $\{S_i\}$ being **cool** be $f(r)$, assuming that (d_x, d_y) is chosen uniformly at random from the circle centered at $(0, 0)$ with a radius r, i.e., $d_x^2 + d_y^2 \le r^2$. Here, a multiset of real numbers S is **cool** if there exists an element x in S such that $\sum_{y \in S} y = 2x$. It can be proved that the limit $\lim_{r\to\infty} f(r)$ does exist, and you need to find this limit.

Input

The first line of input contains a single integer n $(3 \le n \le 2 \times 10^5)$, denoting the number of vertices of polygon P.

The next n lines each contain two integers (x_i, y_i) $(|x_i|, |y_i| \le 10^9)$, denoting the vertices of polygon P. The polygon P is formed by connecting (x_i, y_i) and $(x_{i \bmod n+1}, y_{i \bmod n+1})$ where $1 \le i \le n$. It is guaranteed that the polygon is convex, i.e., every inner angle of the polygon is smaller than π.

Output

The output contains only one real number, denoting your answer.

Let your output be u, and the answer be p. You'll get accepted if and only if $\frac{|u-p|}{\max(1,p)} \le 10^{-6}$.

Examples

standard input	standard output
3 0 0 1 0 0 1	1.000000000000000
4 0 0 0 1 1 1 1 0	0.000000000000000
4 0 0 0 3 1 2 1 1	0.500000000000000

Note

For the first test case, you can see that whatever the two polygons' positions are, the largest of the three projection areas is always the sum of the other two, so the answer is 100%, or 1.0.