

A. All-Save Challenge^{[1][2]}

Problem ID: triangle

After a terrible storm, you receive the locations of n people waiting to be rescued. To protect them until help arrives, you can create a safety zone in the shape of an **equilateral triangle**. The safety zone may be placed anywhere and rotated by any angle. A person is protected if their location is inside the triangle or on its boundary.

Since a larger safety zone requires more energy, you want to make it as small as possible. Find the minimum possible area of a safety zone that protects all n people.

Recall that a triangle is called an equilateral triangle if and only if all its sides have the same length.

Input

The first line contains an integer n .

The i -th line of the next n lines contains two integers x_i and y_i , representing the location of the i -th person.

- $1 \leq n \leq 5 \times 10^5$
- $-10^9 \leq x_i, y_i \leq 10^9$
- No two people are at the same location.

Output

Output the minimum possible area.

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

Sample Input 1	Sample Output 1
3 3 0 4 4 0 3	7.79422863405994782087

Sample Input 2	Sample Output 2
5 -1 -2 3 1 0 4 4 3 -3 2	34.02164503538821491556

Sample Input 3	Sample Output 3
2 -1000000000 -1000000000 1000000000 1000000000	3464101615137754587.05489268301174473389

Note

The following figure shows a minimum-area safety zone for the first sample. The red points represent the locations of the three people.

