

Triple Deluxe

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

points: 100 · problem code: tripledeluxe · author: caneToadCoad

There is nothing that Parsa loves more than point-based geometry problems so he has one for you.

Parsa has a set of n distinct points. He chooses 3 points at uniformly at random. If they are collinear, he chooses again. Otherwise, he finds the area of the triangle made by the three points.

What is the expected area of the triangle?

Input

The first line has n , the number of points Parsa has ($3 \leq n \leq 200$)

n lines follow, each with $x_i y_i$, the coordinates of a point Parsa has $-1e5 \leq x_i, y_i \leq 1e5$.

All points are distinct and guaranteed to not be all collinear.

Output

Write the expected area of a triangle that Parsa chooses. Answers with a relative or absolute error less and $1e-6$ will be accepted.

Sample Input

Input 1

```
5
3 1
5 5
2 -4
3 -1
2 -3
```

Output 1

```
1.3888888888888888
```

Input 2

```
6
7 2
-5 4
-1 -10
-6 -3
-8 9
-7 6
```

Output 2

```
35.5
```

Input 3

```
3
6 7
-16 -11
20 0
```

Output 3

```
203.0
```