Largest Polygon

locked

You are given a set of N points in the XY plane. There are many ways to make polygons (both concave and convex) in the XY plane connecting a subset of these points.
You have to select a subset from the given coordinates so that you can maximize the area of the polygon to find the largest polygon. Your task is to output the number of sides of this largest polygon.

Input Format

First line contains a single integer N, the number of coordinates
N lines follow, with i^{th} of them having 2 integers, x_i , y_i , the x & y coordinates of the i^{th} point

Constraints

- $4 \leq N \leq 10^3$
- $1 \leq x_i , y_i \leq 10^6$
- More than *25%* of the test cases will have $N \leq 100$

Limits

- **Time Limit:** 1s
- **Memory Limit:** 256MB

Output Format

A single integer, the number of sides in the largest polygon.

Sample Input 0

```
5
2 2
0 2
1 1
0 0
2 0
```

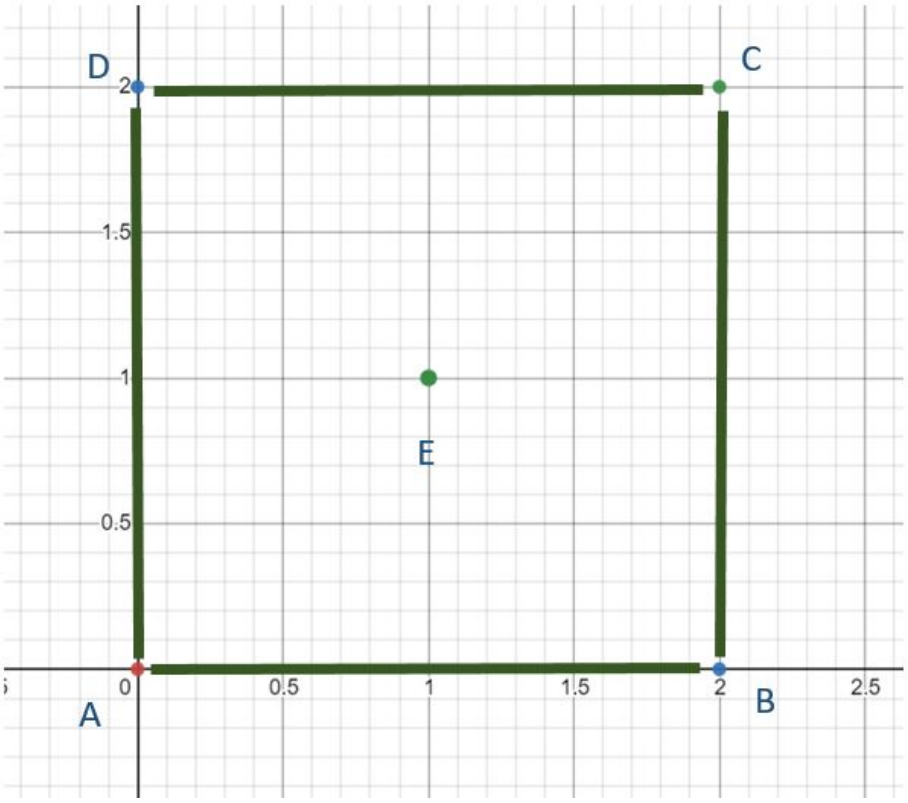
Sample Output 0

```
4
```

Explanation 0

It is possible to make **8 distinct triangles** and **one square** from different subsets of the given points

In order to maximize the area we can choose **(0,0) , (0,2) , (2,2) and (0,2)** and draw a square as shown in the figure.



Sample Input 1

```
10
0 2
1 2
2 1
0 1
1 1
2 2
3 1
0 0
1 0
2 0
```

Sample Output 1

```
5
```

Explanation 1

Largest polynomial can be made by joining all the points (A,B,C,D,G,H,I,G) except E(1,1) and F(2,1) as shown in the figure. Here the points (A,B,C) , (A,D,H) , (H,I,J) are Collinear.