Points And Circles

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

There are n points in the plane. Two circles are equivalent if they contain the same set of the given n points. For the given set of points, how many non-equivalent circles are there?

Input

The first line contains the integer n ($0 \le n \le 500$).

Each of the next n lines contains two integers x_i and y_i — coordinates of i-th point ($-30\,000 \le x_i, y_i \le 30\,000$).

It is guaranteed that all points are distinct, no three points lie on a common line and no four points lie on a common circle.

Output

Print the answer to the problem.

Examples

standard input	standard output
1 0 0	2
4 0 0 1 0 0 1 -1 -1	15