

Contest Duration: 2025-08-09(Sat) 22:00 (<http://www.timeanddate.com/worldclock/fixedtime.html?iso=20250809T2100&p1=248>) - 2025-08-09(Sat) 23:40 (<http://www.timeanddate.com/worldclock/fixedtime.html?iso=20250809T2240&p1=248>) (local time) (100 minutes)

[Back to Home \(/home\)](#)

[Top \(/contests/abc418\)](#)

[Tasks \(/contests/abc418/tasks\)](#)

[Clarifications \(/contests/abc418/clarifications\)](#) [Results ▾](#)

[Standings \(/contests/abc418/standings\)](#)

[Virtual Standings \(/contests/abc418/standings/virtual\)](#) [Editorial \(/contests/abc418/editorial\)](#)

[Discuss \(<https://codeforces.com/blog/entry/145383>\)](#)



## E - Trapezium

[Editorial \(/contests/abc418/tasks/abc418\\_e/editorial\)](#)



Time Limit: 4 sec / Memory Limit: 1024 MiB

Score : 475 points

### Problem Statement

There are  $N$  points on a two-dimensional plane, with the  $i$ -th point at coordinates  $(X_i, Y_i)$ . It is guaranteed that no two points are at the same position, and no three points are collinear.

Among the combinations of four points from these points, how many combinations can form a trapezoid as a polygon with those four points as vertices?

### Constraints

- $4 \leq N \leq 2\,000$
- $0 \leq X_i, Y_i \leq 10^7$  ( $1 \leq i \leq N$ )
- No two points are at the same location.
- No three points are collinear.
- All input values are integers.

### Input

The input is given from Standard Input in the following format:

$N$   
 $X_1 \ Y_1$   
 $\vdots$   
 $X_N \ Y_N$

## Output

Print the answer on one line.

### Sample Input 1

[Copy](#)

```
5  
0 2  
0 5  
1 0  
2 1  
2 4
```

[Copy](#)

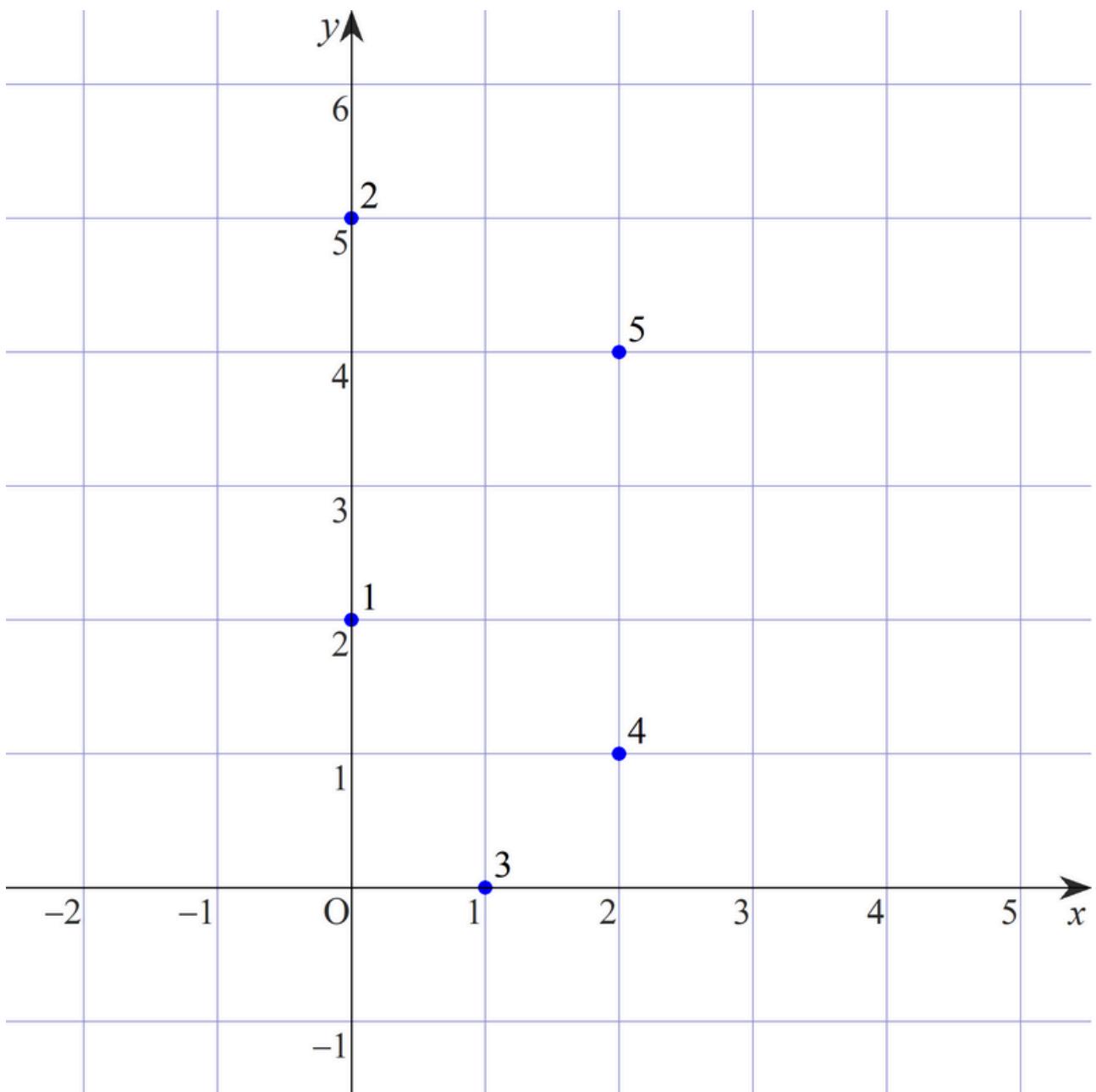
### Sample Output 1

[Copy](#)

```
3
```

[Copy](#)

The given points are arranged as shown in the figure below.



Among the combinations of four points, the following three combinations can form a trapezoid as a polygon with those points as vertices:

- The 1st, 5th, 4th, 3rd points.
- The 1st, 3rd, 4th, 2nd points.
- The 1st, 2nd, 5th, 4th points.

Note that parallelograms and rectangles are also treated as trapezoids.

---

## Sample Input 2

[Copy](#)

[Copy](#)

```
8
0 1
1 3
2 3
3 1
0 2
1 0
2 0
3 2
```

## Sample Output 2

[Copy](#)

```
22
```

[Copy](#)

---

```
'#telegram)
```

```
url=https%3A%2F%2Fatcoder.jp%2Fcontests%2Fabc418%2Ftasks%2Fabc418_e%3Flang%3Den&title=E%20-
```

---

[Rule \(/contests/abc418/rules\)](#) [Glossary \(/contests/abc418/glossary\)](#)

[Terms of service \(/tos\)](#) [Privacy Policy \(/privacy\)](#) [Information Protection Policy \(/personal\)](#) [Company \(/company\)](#)

[FAQ \(/faq\)](#) [Contact \(/contact\)](#)

Copyright Since 2012 ©AtCoder Inc. (<http://atcoder.co.jp>) All rights reserved.