Problem 3625: Count Number of Trapezoids II

Problem Information

Difficulty: Hard
Acceptance Rate: 0.00%
Paid Only: No

Problem Description

You are given a 2D integer array

points

where

points[i] = [x

i

, y

i

]

represents the coordinates of the

i

th

point on the Cartesian plane.

Return

the number of unique

trapezoids

that can be formed by choosing any four distinct points from

points

.

A

trapezoid

is a convex quadrilateral with

at least one pair

of parallel sides. Two lines are parallel if and only if they have the same slope.

Example 1:

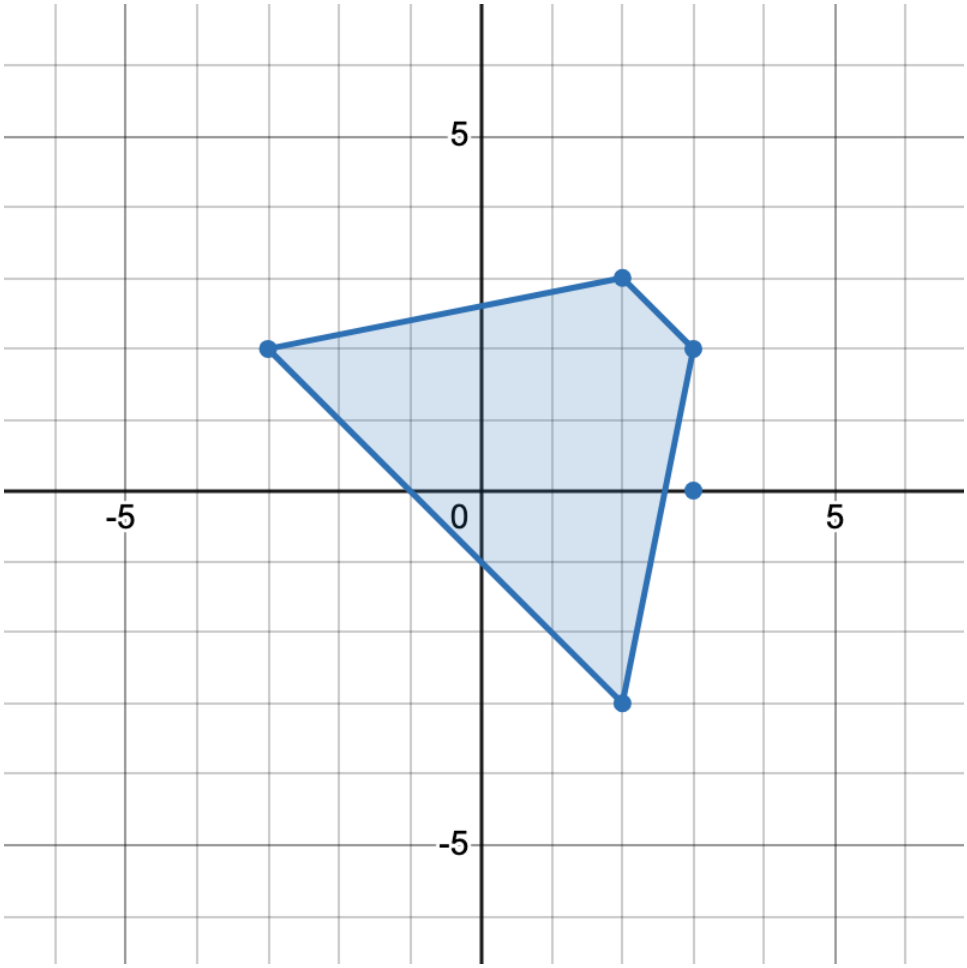
Input:

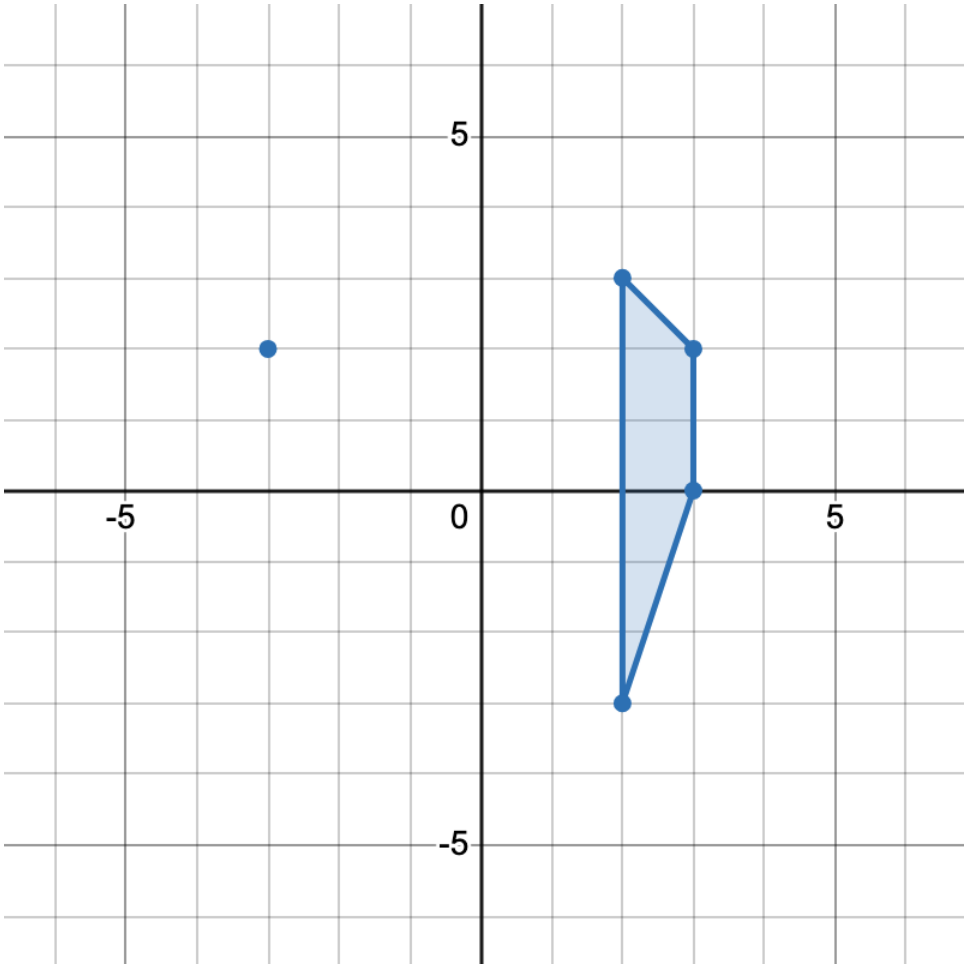
points = [[-3,2],[3,0],[2,3],[3,2],[2,-3]]

Output:

2

Explanation:


5
-5
0
5
-5



There are two distinct ways to pick four points that form a trapezoid:

The points

[-3,2], [2,3], [3,2], [2,-3]

form one trapezoid.

The points

[2,3], [3,2], [3,0], [2,-3]

form another trapezoid.

Example 2:

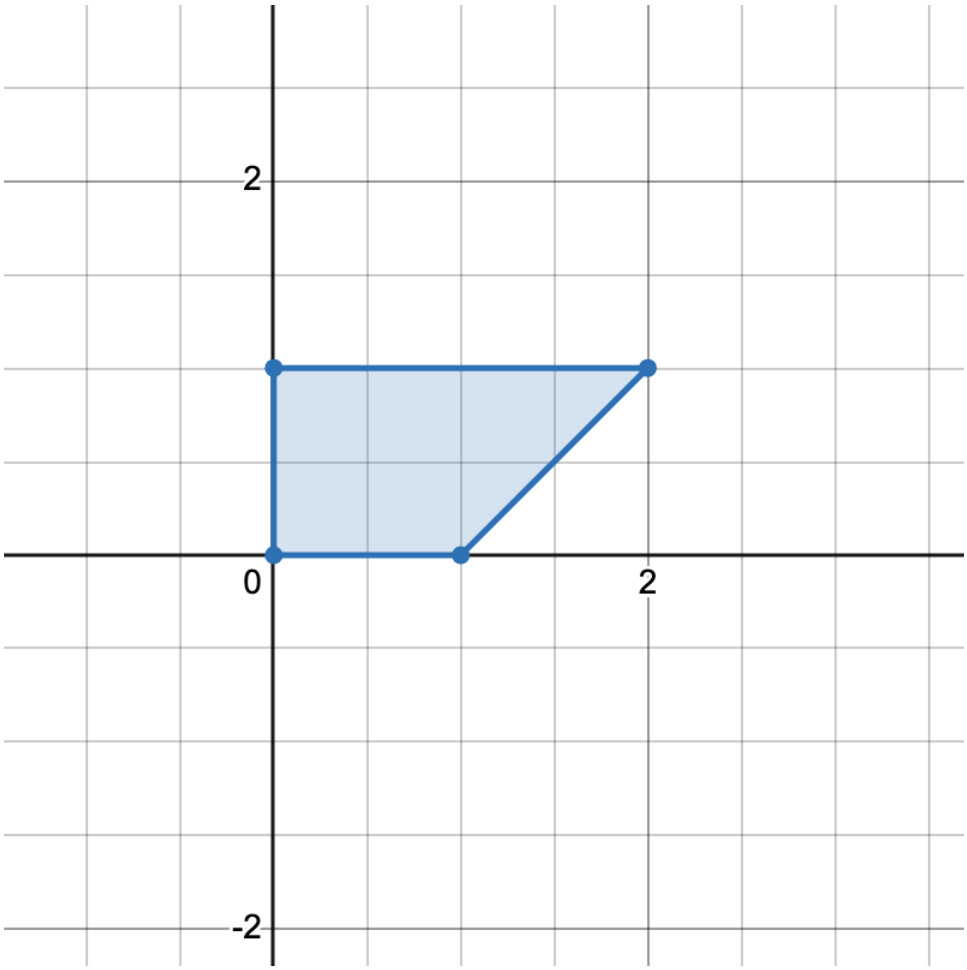
Input:

points = [[0,0],[1,0],[0,1],[2,1]]

Output:

1

Explanation:



There is only one trapezoid which can be formed.

Constraints:

4 <= points.length <= 500

–1000 <= x

i

, y

i

<= 1000

All points are pairwise distinct.

Code Snippets

C++:

```
class Solution {
public:
int countTrapezoids(vector<vector<int>>& points) {

}
};
```

Java:

```
class Solution {
public int countTrapezoids(int[][] points) {

}
}
```

Python3:

```
class Solution:
def countTrapezoids(self, points: List[List[int]]) -> int:
```

Python:

```
class Solution(object):
def countTrapezoids(self, points):
"""
:type points: List[List[int]]
:rtype: int
"""
```

JavaScript:

```
/**
* @param {number[][]} points
* @return {number}
*/
var countTrapezoids = function(points) {

};
```

TypeScript:

```
function countTrapezoids(points: number[][]): number {

};
```

C#:

```
public class Solution {
public int CountTrapezoids(int[][] points) {

}
}
```

C:

```
int countTrapezoids(int** points, int pointsSize, int* pointsColSize) {

}
```

Go:

```
func countTrapezoids(points [][]int) int {

}
```

Kotlin:

```
class Solution {
fun countTrapezoids(points: Array<IntArray>): Int {

}
}
```

Swift:

```
class Solution {
func countTrapezoids(_ points: [[Int]]) -> Int {

}
}
```

Rust:

```
impl Solution {
pub fn count_trapezoids(points: Vec<Vec<i32>>) -> i32 {

}
}
```

Ruby:

```
# @param {Integer[][]} points
# @return {Integer}
def count_trapezoids(points)

end
```

PHP:

```
class Solution {

/**
* @param Integer[][] $points
* @return Integer
*/
function countTrapezoids($points) {

}
}
```

Dart:

```
class Solution {
int countTrapezoids(List<List<int>> points) {

}
```

```
}
```

Scala:

```
object Solution {
def countTrapezoids(points: Array[Array[Int]]): Int = {

}
}
```

Elixir:

```
defmodule Solution do
@spec count_trapezoids(points :: [[integer]]) :: integer
def count_trapezoids(points) do

end
end
```

Erlang:

```
-spec count_trapezoids(Points :: [[integer()]]) -> integer().
count_trapezoids(Points) ->
.
```

Racket:

```
(define/contract (count-trapezoids points)
(-> (listof (listof exact-integer?)) exact-integer?)
)
```

Solutions

C++ Solution:

```
/*
* Problem: Count Number of Trapezoids II
* Difficulty: Hard
* Tags: array, graph, math, hash
*
```

```
* Approach: Use two pointers or sliding window technique
* Time Complexity: O(n) or O(n log n)
* Space Complexity: O(n) for hash map
*/

class Solution {
public:
int countTrapezoids(vector<vector<int>>& points) {

}
};
```

Java Solution:

```
/**
* Problem: Count Number of Trapezoids II
* Difficulty: Hard
* Tags: array, graph, math, hash
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* Approach: Use two pointers or sliding window technique
* Time Complexity: O(n) or O(n log n)
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*/

class Solution {
public int countTrapezoids(int[][] points) {

}
}
```

Python3 Solution:

```
"""
Problem: Count Number of Trapezoids II
Difficulty: Hard
Tags: array, graph, math, hash

Approach: Use two pointers or sliding window technique
Time Complexity: O(n) or O(n log n)
Space Complexity: O(n) for hash map
"""
```

```
class Solution:
def countTrapezoids(self, points: List[List[int]]) -> int:
# TODO: Implement optimized solution
pass
```

Python Solution:

```
class Solution(object):
def countTrapezoids(self, points):
"""
:type points: List[List[int]]
:rtype: int
"""
```

JavaScript Solution:

```
/**
* Problem: Count Number of Trapezoids II
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TypeScript Solution:

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function countTrapezoids(points: number[][]): number {

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C# Solution:

```
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*/

int countTrapezoids(int** points, int pointsSize, int* pointsColSize) {
```

```
}
```

Go Solution:

```
// Problem: Count Number of Trapezoids II
// Difficulty: Hard
// Tags: array, graph, math, hash
//
// Approach: Use two pointers or sliding window technique
// Time Complexity: O(n) or O(n log n)
// Space Complexity: O(n) for hash map

func countTrapezoids(points [][]int) int {

}
```

Kotlin Solution:

```
class Solution {
fun countTrapezoids(points: Array<IntArray>): Int {

}
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```

Swift Solution:

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class Solution {
func countTrapezoids(_ points: [[Int]]) -> Int {

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impl Solution {
pub fn count_trapezoids(points: Vec<Vec<i32>>) -> i32 {

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Ruby Solution:

```
# @param {Integer[][]} points
# @return {Integer}
def count_trapezoids(points)

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PHP Solution:

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