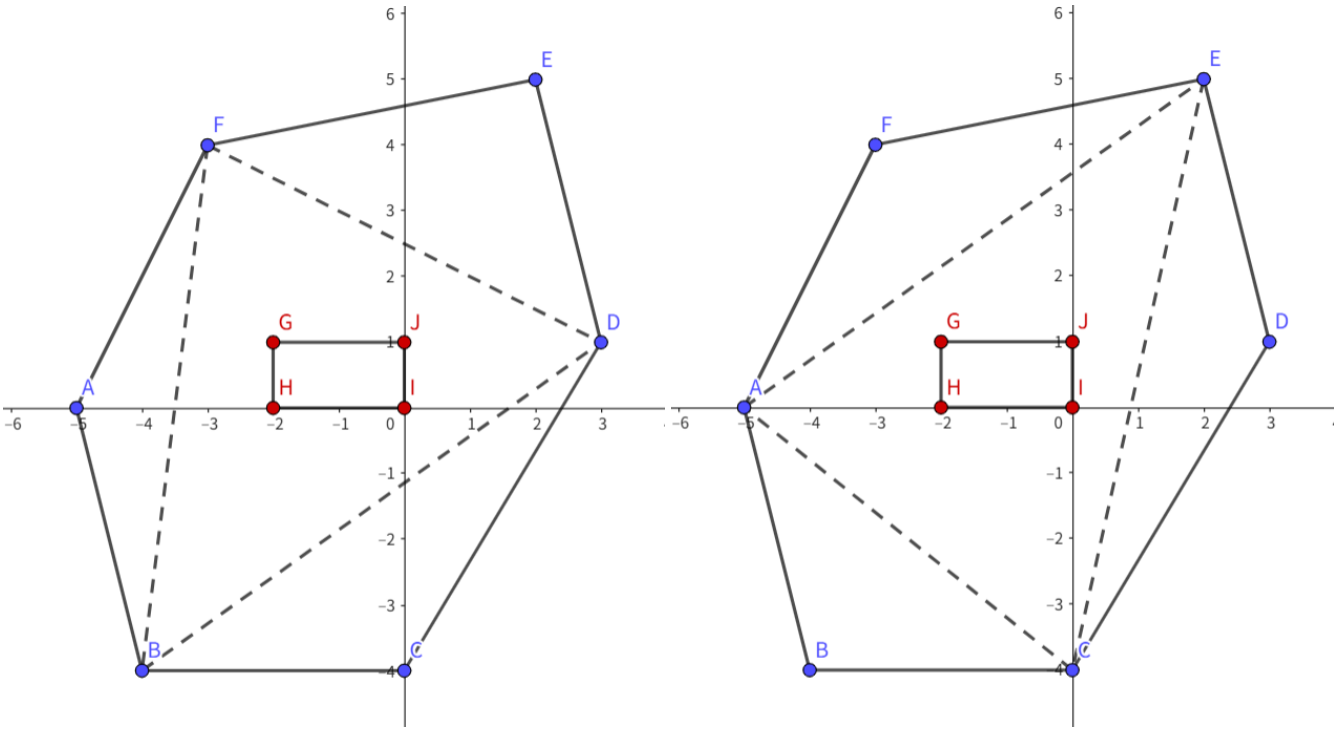
Inside Triangle

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	1024 megabytes

A polygon P_1 contains polygon P_2 if every point in or on P_2 is also in or on P_1. A polygon P_1 **strictly** contains P_2 if every point in or on P_2 is strictly inside P_1 (no point on the boundary).

Panda has two convex polygons, P and Q. Polygon P has n vertices, and polygon Q has m vertices. It is guaranteed that Q is **strictly** contained by P.

You should help Panda find the total number of ways to choose exactly 3 distinct vertices from polygon P that form a triangle P_Δ such that P_Δ (not strictly) contains polygon Q.



Input

The first line contains a single integer T ($1 \le T \le 1000$), denoting the number of test cases.

For each test case, the first line contains an integer n ($3 \le n \le 3 \cdot 10^5$), denoting the number of vertices of P.

For the next n lines, each line contains two integers x, y ($|x|, |y| \le 10^9$), denoting the coordinates of the vertices of P. It is guaranteed that the vertices are given in counter-clockwise order, and no three vertices are collinear.

The next line contains an integer m ($3 \le m \le 3 \cdot 10^5$), denoting the number of vertices of Q.

For the next m lines, each line contains two integers x, y ($|x|, |y| \le 10^9$), denoting the coordinates of the vertices of Q. It is guaranteed that the vertices are given in counter-clockwise order, and no three vertices are collinear, and Q is **strictly** contained by P.

It is guaranteed that both $\sum n$ and $\sum m$ over all test cases do not exceed $5 \cdot 10^5$.

Output

For each test case, output an integer in a single line, denoting the answer.

Example

standard input	standard output
3 6 -5 0 -4 -4 0 -4 3 1 2 5 -3 4 4 -2 1 -2 0 0 0 0 1 6 -5 0 -4 -4 0 -4 3 1 2 5 -3 4 4 -1 1 -1 0 0 0 0 1 7 1 -3 4 -1 5 0 1 4 0 4 -1 0 0 -2 3 0 0 2 0 0 2	2 4 6

Note

For the first example, as shown in the figure, the polygon P is $ABCDEF$, and the polygon Q is $GHIJ$. The triangles $\triangle ACE$ and $\triangle BDF$ are the ones that contain Q.