Problem E
Eclipse

In today's science class, the whole class was taught about solar eclipses. Since this is a process that rarely occurs, and is not simple or spacious, to illustrate for the students, the teacher wrote a computer program to simulate this phenomenon.

The teacher's program uses computer graphics, displaying a plane on the Oxy coordinate system. On the screen, the teacher drew two **convex** polygons, one represents the sun and one represents the moon. To illustrate the process of a solar eclipse, the teacher rotates the moon polygon around the origin, and when the moon is completely within the sun, the teacher says this is the phenomenon of a solar eclipse!

All the students were very interested in the teacher's illustration and took turns operating the teacher's program. The teacher's program has many advanced features, allowing students to modify the two polygons as they wish as long as they remain convex polygons. However, not every pair of moon and sun polygons can create a solar eclipse phenomenon.

Given a pair of **convex** polygons representing the moon and the sun from the students, your task is to check whether there exists an angel to rotate the moon polygon around the origin so that the solar eclipse phenomenon occurs.

Define $P(X)$ the set of points which are inside the polygon X and on the edges of polygon X.

Polygon A is said to be completely inside polygon B if $P(A) \subset P(B)$.

When rotating polygon A around the origin with angle α, all points belonging to $P(A)$ will be rotated around the origin with angle α.

Input

The first line of the input contains a single integer t $(1 \leq t \leq 10^4)$ – the number of test cases. t test cases follow, each is presented as below:

- The first line contains an integer n $(3 \leq n \leq 1000)$ – the number of vertices of the polygon representing the sun.
- In the next n lines, the i-th one contains two integers x_i and y_i $(0 \leq |x_i|, |y_i| \leq 10^6)$ – the coordinates of the i-th point of the polygon representing the sun.
- The next line contains an integer m $(3 \leq m \leq 1000)$ – the number of vertices of the polygon representing the moon.
- In the last m lines, the j-th one contains two integers The j-th line of the following m lines contains a pair of integers x_j and y_j $(0 \leq |x_j|, |y_j| \leq 10^6)$ — the coordinates of the j-th point of the polygon representing the moon.

It is guaranteed that:

- All polygons are convex.
- Points of each polygon are listed in the counterclockwise order.

- No three consecutive points of each polygon are collinear.
- If there exists an angle α so that the solar eclipse phenomenon occurs, there will also exist an angle β so that **all** angels $\gamma \in [\beta; \beta + 10^{-6}]$ have this property. Angels are measured in radian.
- The sum of $n \times m$ over all test cases does not exceed 10^6.

Output

For each test case, print "`YES`" (without quotes) if there exists a rotation angle for the moon polygon such that the solar eclipse phenomenon occurs, otherwise print "`NO`" (without quotes).

Sample Explanation

In this section, figures 1, 2 and 3 illustrate the first, second and third test cases, respectively.

In the first test case, the triangle `ABC` represents the sun, and the **shaded** quadrilateral `DEFG` represents the moon. The quadrilateral with **dotted** edges, `D′E′F′G′`, is obtained by rotating the quadrilateral `DEFG` around the origin `O`, and it completely lies inside the triangle `ABC`. Thus, the answer for this test case is `YES`.

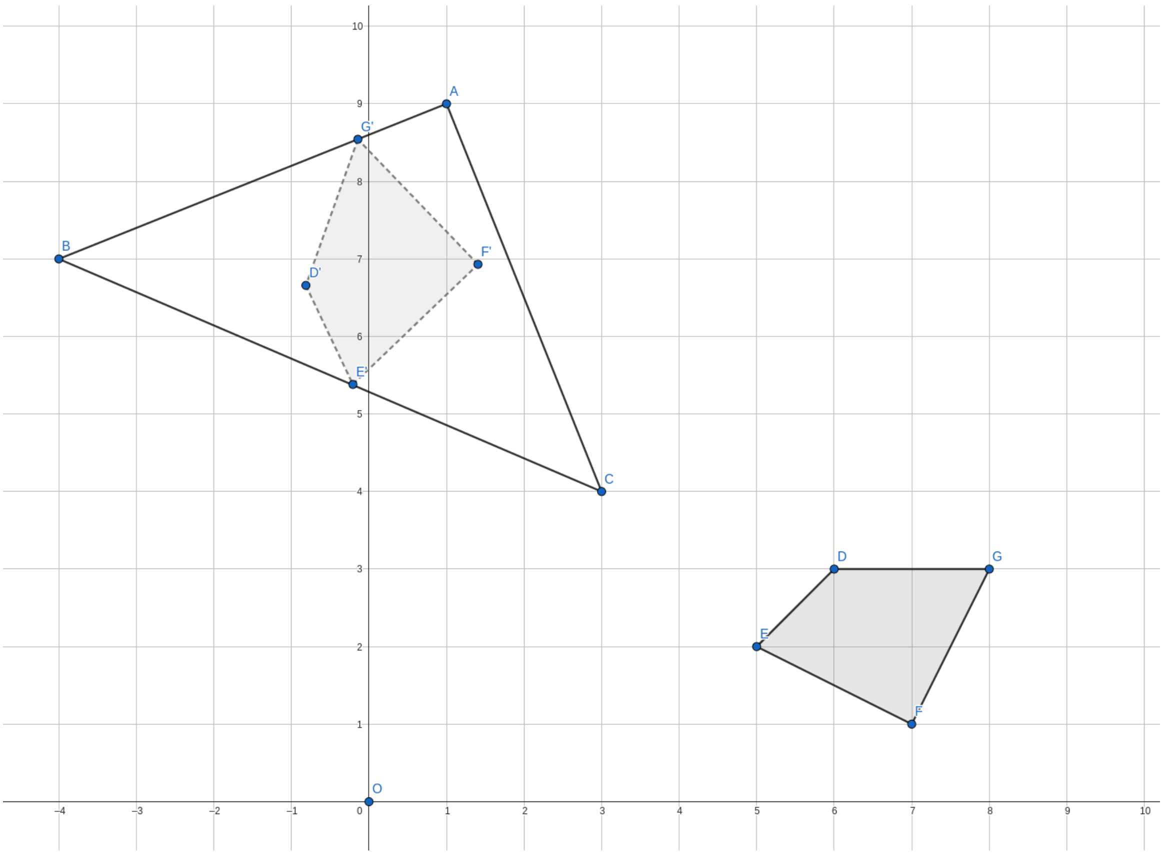

Figure E.1: Illustration for the first test case

In the second test case, the quadrilateral `ABCD` represents the sun, and the **shaded** triangle `EFG` represents the moon. It is impossible to rotate the triangle `EFG` around the origin so that it completely lies inside the quadrilateral `ABCD`. Thus, the answer is `NO`.

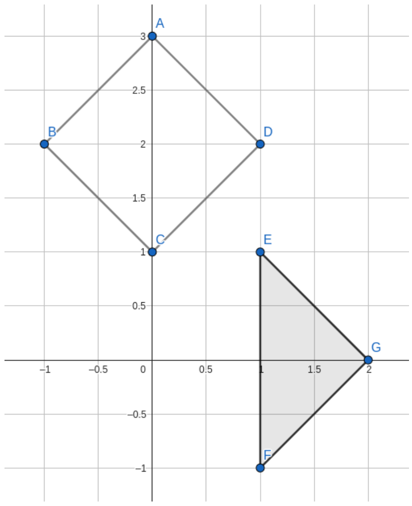

Figure E.2: Illustration for the second test case

In the third test case, the quadrilateral `ABCD` represents the sun, and the **shaded** triangle `IJK` represents the moon. The triangle with **dotted** edges, `I′J′K′`, is the image of the triangle `IJK`, under the rotation of angle $\frac{\pi}{4}$ about the origin; which completely lies inside the quadrilateral `ABCD`. Please note that there are other angles that cause the eclipse phenomenon, including $\frac{3\cdot\pi}{4}$, $\frac{5\cdot\pi}{4}$ and $\frac{7\cdot\pi}{4}$.

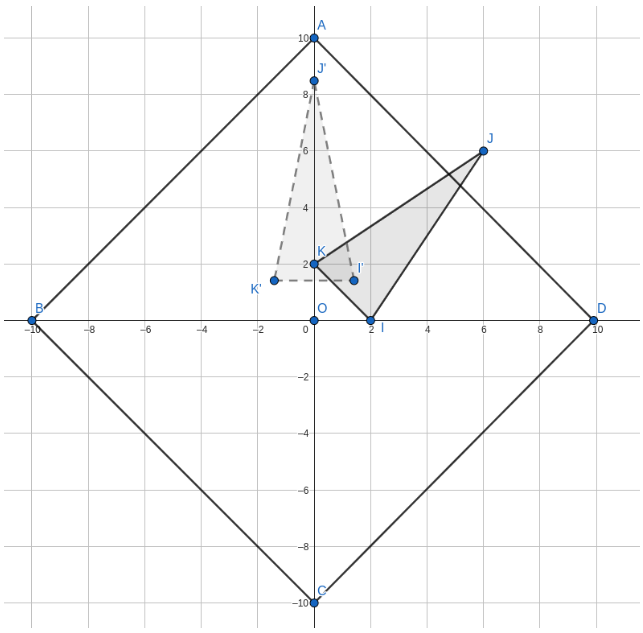

Figure E.3: Illustration for the third test case

Sample Input 1	Sample Output 1
3 3 1 9 -4 7 3 4 4 6 3 5 2 7 1 8 3 4 0 3 -1 2 0 1 1 2 3 1 1 1 -1 2 0 4 0 10 -10 0 0 -10 10 0 3 2 0 6 6 0 2	YES NO YES