

Origami Warp

Input file: **standard input**
Output file: **standard output**
Time limit: 3 seconds
Memory limit: 1024 megabytes

You are given N lines on the xy -plane. The i -th line ($1 \leq i \leq N$) passes through two distinct points (a_i, b_i) and (c_i, d_i) . Specifically, $(a_1, b_1, c_1, d_1) = (0, 0, 1, 0)$ and $(a_2, b_2, c_2, d_2) = (0, 0, 0, 1)$. That is, the first line represents the x -axis, and the second line represents the y -axis.

Alice is on the xy -plane. She can perform the following operation any number of times (including zero):

Choose one of the N given lines. Alice moves to the position symmetric to her current position with respect to the chosen line.

Additionally, we define that point P is **reachable** from point S if the following condition is satisfied:

For any real number $\varepsilon > 0$, there exists a point Q such that the Euclidean distance between Q and P is at most ε , and Alice can move from S to Q in a finite number of operations.

Answer Q queries. For the i -th query ($1 \leq i \leq Q$), you are given integers X_i, Y_i, Z_i, W_i . Output **Yes** if (Z_i, W_i) is reachable from (X_i, Y_i) . Otherwise, output **No**.

You are given T test cases; solve each of them.

Input

The input is given in the following format:

```
T
case1
case2
⋮
caseT
```

Here, case _{i} represents the i -th test case. Each test case is given in the following format:

```
N
a1 b1 c1 d1
a2 b2 c2 d2
⋮
aN bN cN dN
Q
X1 Y1 Z1 W1
X2 Y2 Z2 W2
⋮
XQ YQ ZQ WQ
```

- All input values are integers.
- $1 \leq T \leq 100$
- For each test case:

- $2 \leq N \leq 2000$
- $1 \leq Q \leq 2000$
- $-10^8 \leq a_i, b_i, c_i, d_i \leq 10^8$ ($1 \leq i \leq N$)
- $(a_i, b_i) \neq (c_i, d_i)$
- $(a_1, b_1, c_1, d_1) = (0, 0, 1, 0)$
- $(a_2, b_2, c_2, d_2) = (0, 0, 0, 1)$
- All given lines are distinct.
- $-10^8 \leq X_i, Y_i, Z_i, W_i \leq 10^8$ ($1 \leq i \leq Q$)

Output

For each test case, output Q lines. The i -th line ($1 \leq i \leq Q$) should contain the answer to the i -th query. The output should be **Yes** if (Z_i, W_i) is reachable from (X_i, Y_i) , otherwise **No**. The output is case-insensitive.

Example

standard input	standard output
2	Yes
3	Yes
0 0 1 0	No
0 0 0 1	Yes
0 2 2 0	Yes
4	Yes
1 0 2 3	
1 -2 -1 2	
1 1 -1 0	
3 3 3 3	
3	
0 0 1 0	
0 0 0 1	
-2 1 2 3	
2	
2 1 -1 5	
-1 -1 3 3	

Note

Let us explain the first test case. For the first query, Alice can use the second and third lines in sequence to move $(1, 0) \rightarrow (-1, 0) \rightarrow (2, 3)$. Thus, $(2, 3)$ is reachable from $(1, 0)$. Note that for the fourth query, if $(X_i, Y_i) = (Z_i, W_i)$, the destination is always reachable.

Now let us explain the second test case. For the first query, Alice can use the first and third lines in sequence to move $(2, 1) \rightarrow (2, -1) \rightarrow (-\frac{6}{5}, \frac{27}{5})$. The distance between $(-1, 5)$ and $(-\frac{6}{5}, \frac{27}{5})$ is $\frac{1}{\sqrt{5}}$. This means that for $\varepsilon \geq \frac{1}{\sqrt{5}}$, Alice can find a point Q that satisfies the “reachable” condition. Moreover, for any $\varepsilon > 0$, Alice can find such a point Q . As a result, $(2, 1)$ is reachable from $(-1, 5)$.