Problem I. Infrared

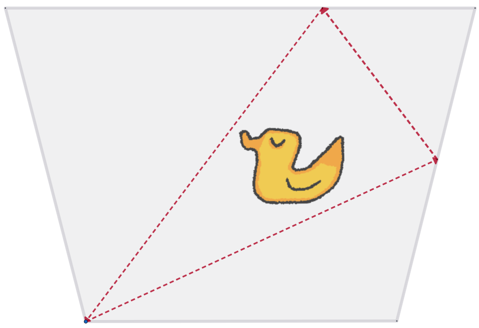
Input file:	*standard input*
Output file:	*standard output*
Time limit:	1 second
Memory limit:	256 mebibytes

You've just added the crown jewel to your rubber duck collection: a royal rubber duck. Sadly, Akulyat has already caught the scent and is speeding toward your vault to steal it.

To protect it, you've placed the duck inside the safest room of your vault. The room is shaped like a convex polygon with n vertices, and thus has n walls. There is a secure door located at vertex 1. This door is equipped with an infrared laser system that protects walls 1 (between vertices 1 and 2) and n (between vertices n and 1).

However, you're worried about the unprotected walls 2 through $n-1$. Fortunately, the security system also has a powerful laser emitter and receiver installed at vertex 1. You want to aim the laser in such a way that:

- it starts at vertex 1,
- reflects in this exact order off wall 2, then wall 3, and so on until it reflects off wall $n-1$,
- and finally returns precisely to vertex 1.



All reflections follow the laws of ideal optics (angle of incidence equals angle of reflection), and the polygon is convex. You need to determine if it is possible to align the laser in the described way. If so, compute the required firing angle.

The base direction (angle 0°) is the positive x-axis, and angles are measured in degrees counter-clockwise.

Important: To not mess up the optics, you decided to have all reflection points strictly inside their respective walls: more precisely, to be at least 10^{-5} **relative** units away from both endpoints. Formally, the valid points of reflection p for the wall $[a, b]$ are of the form $p = \alpha a + (1-\alpha)b$, where $\min(\alpha, 1-\alpha) \geq 10^{-5}$.

Input

Each test contains multiple test cases. The first line contains the number of test cases t ($1 \leq t \leq 1000$). The description of the test cases follows.

For each test case, the first line contains a single integer n ($3 \leq n \leq 20$): the number of vertices of the convex polygon.

Each of the next n lines contains two integers x_i and y_i ($-10^9 \leq x_i, y_i \leq 10^9$): the coordinates of the vertices. The vertices are given in counter-clockwise order and form a strictly convex polygon.

Output

For each test case, output a single line "NO" if there is no answer.

Otherwise output two lines. The first line must contain "YES". On the second line, print a real number d ($-180 \le d \le 180$): the angle (in degrees) relative to the positive x-axis (counter-clockwise), at which the laser should be fired towards wall 2.

The trajectory of the ray should hit all the walls in required order at points inside the walls, and end in the 10^{-7}-neighborhood of vertex 1. The 10^{-7}-neighborhood of vertex 1 is defined as any point (x, y) on the walls 1 or n that follows $(x_1 - x)^2 + (y_1 - y)^2 < (10^{-7} \cdot L)^2$, where L is the total length of polygon sides.

If multiple angles satisfy the condition, output any one suitable angle.

Examples

<table>
<tr><th>standard input</th><th>standard output</th></tr>
<tr><td>2
3
1 2
0 0
2 0
4
0 0
1 0
1 1
0 1</td><td>YES
-90
NO</td></tr>
<tr><td>3
4
0 0
4 0
5 4
-1 4
5
-809016994 -587785252
309016994 -951056516
1000000000 0
309016994 951056516
-809016994 587785252
6
-1000000000 0
-500000000 -866025404
500000000 -866025404
1000000000 0
500000000 866025404
-500000000 866025404</td><td>YES
24.623564786163612980174342226292
YES
9.7323013977077787754407789400009
NO</td></tr>
</table>

Note

Illustration for the first test case of the second example is provided in the statement.

It is guaranteed that, for each test with answer "YES", there exists a shooting angle that has all its reflections at points $p = \alpha a + (1-\alpha)b$, where $\min(\alpha, 1-\alpha) \ge 10^{-5} + 10^{-9}$). It is also guaranteed that, for each test with answer "NO", there are no shooting angles that are *almost* valid: this means that at some point there is either no intersection, or $\min(\alpha, 1-\alpha) < 10^{-5} - 10^{-9}$.