Time Limit	**20** test inputs must be executed within 1 second using C/C++ or 1.5 seconds using Java
Memory Limit	Stack : **1** Mbytes / Total : **256** Mbytes
Maximum Number of Answer Submissions	**10**
Evaluation	When you submit an answer, the result will be shown in real time as below. **"Pass" means that the answer is correct for all of the test inputs** **"Fail" means that the answer is incorrect for all of part of the test inputs** ※ Test Input : a data which is automatically inputted when submitted code is run in the test system
Evaluation Criteria	The number of correct test inputs

Deepak, who hates mosquitos, decided to use a unique material in order to kill all of mosquitos in his house. When the light shines on this material, this material makes a "P" beam that kills mosquitos.

The light shines from left top toward right bottom, and keeps a 60 degree from the material as in the diagram below.

The P beam splits into 2 : the first half permeates into the material as refracted, and the latter half reflects off the material.

The permeated P beam keeps the degree where the horizontal vs. vertical proportions are 2:1, whereas the reflected P beam keeps the degree where the horizontal vs. vertical proportions are 1:2.

The unique material is hung at the height of 50,000 (the material's length is unlimited), and the light can move either to the left or right at the height of 100,000. How many times must Deepak move the light in order to kill all mosquitos?

For example, there are 4 mosquitos in Deepak's house at the coordinates of (1, 50002), (2, 50002), (2, 49999), and (2, 50004).

In this case, if Deepak shines the light on (0, 50000), then the divided P beam will kill the mosquitos at (1, 50002), (2, 49999) and (2, 50004). Nevertheless, this light cannot kill the mosquito at (2, 50002). To kill it, Deepak must move the light and shine on (1, 50000). Then, Deepak can kill the mosquito at (2, 50002) with the reflected P beam.
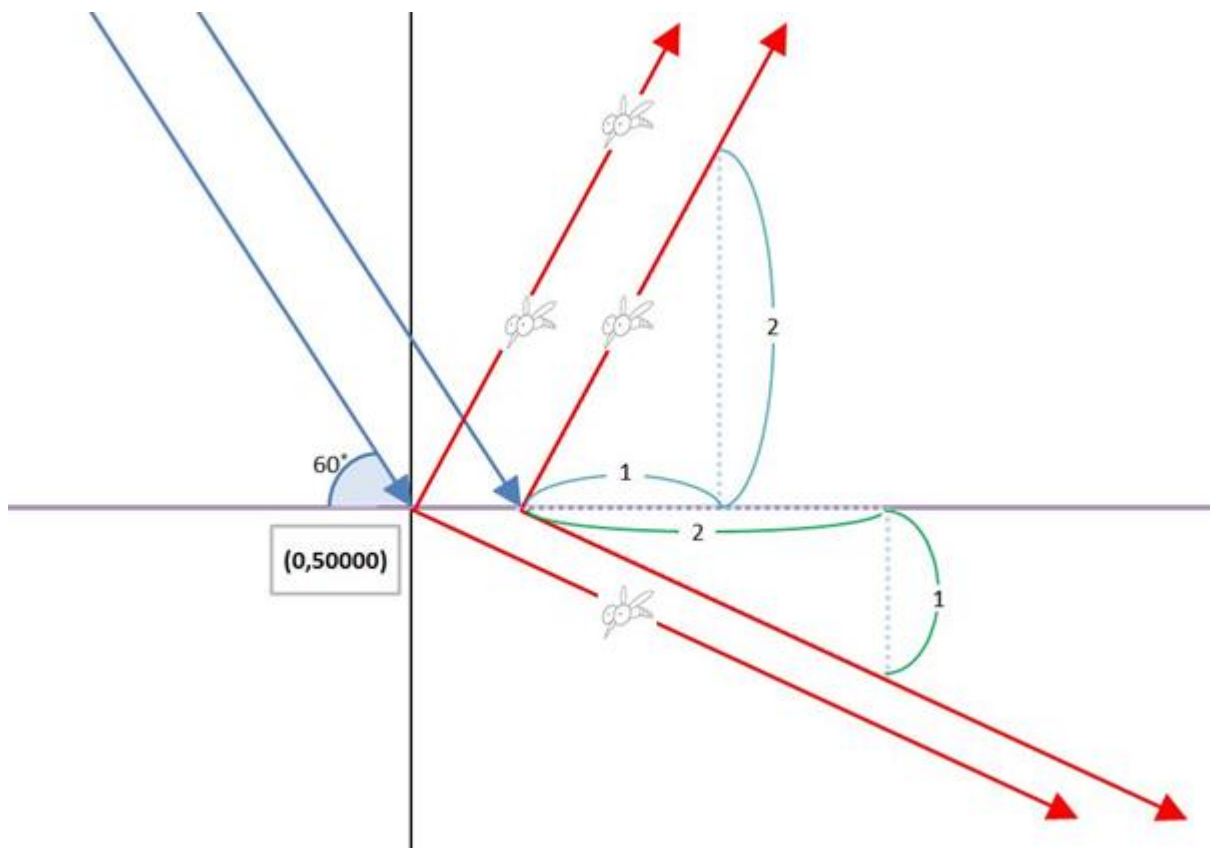
Write code to figure out how many times Deepak must shine the light in order to kill all mosquitos.

[Limits]

1. Deepak can move the light only when it is turned off.
2. The mosquitos in Deepak's house do not move from one place to another.
3. Mosquito's location does not overlap that of unique material. (It does not sit on the unique material)
4. Two or more mosquitos can sit on the same coordinate.
5. P beam shines continuously even after killing a mosquito in the line.
6. The light, before reflecting or permeating the unique material, cannot kill mosquitos.
7. The light always shines toward the right bottom side at fixed degree.

[Input]

In the first line, <u>the number of test cases (T)</u> is input. Second line starts with 1st test case.

In the first line of each test case, N (number of mosquitos) is given.

For next N lines, the coordinates of mosquitos x, y are given.

$3 \leq N \leq 30,000$

$0 < x, y < 100,000$

[Output]

Print the answers to each of test cases. Each line begins with "#x" (x is a test case number), followed by a space, and then the minimum numbers of light-shining.

[Sample Input and Output]

(Input)

3
4
1 50002
2 50002
2 49999
2 50004
6
822 50001
822 50002
823 50002
823 50003
823 50004
824 50004
4
1 99999
2 1
99999 99999
99999 1

(Output)

#1 2
#2 3
#3 4

(Output to "sample_input.txt")

#1 28149
#2 28186
#3 28198
#4 28201
#5 28087
#6 28128
#7 28165

#8 28168
#9 28133
#10 28149