Snowball Fight

Winter is a special time. The first real snowstorm hits, the lakes freeze over, the houses become snowcapped, trees have finally shed all their colors and become frosty skeletons. Everything outside becomes quiet.

Well, not entirely…Ever since they were small children, Lea and her friends have always loved this time. Why? Because once a year, the whole town comes together and celebrates the "Snowball Arena: Free-for-all". For a day, the whole town stands still and anyone who is spotted on the streets can be subject to snowball bombardment. It is an event of joy and of tears, where grown men cry, bombarded by endless blizzards of snowballs, thrown by the hands of children. To make it even more fun, the townspeople have dug trenches on the central square so there are now several fronts that can be besieged.

Of course, Lea takes part in all that. Right now, she is lying alone in one of the trenches and is bombarded by one particularly persistent fellow. To avoid being hit, she needs to keep her head low - thus, she cannot spot her attacker directly. All his snowballs came from the same direction however, so to retaliate, she only needs to know how far her attacker is away.

Luckily, she notices something - to the side of the central square, there is a huge new building[1]. There are no visible windows on the front wall, but rather the whole wall of that building is a huge mirror. Noticing that this could give her a substantial combat advantage, she watches out for movements in the mirror. As soon as she spots someone, she wants to lob a snowball over the siege lines and hit that person right in the face. Can you help her with the target computations?

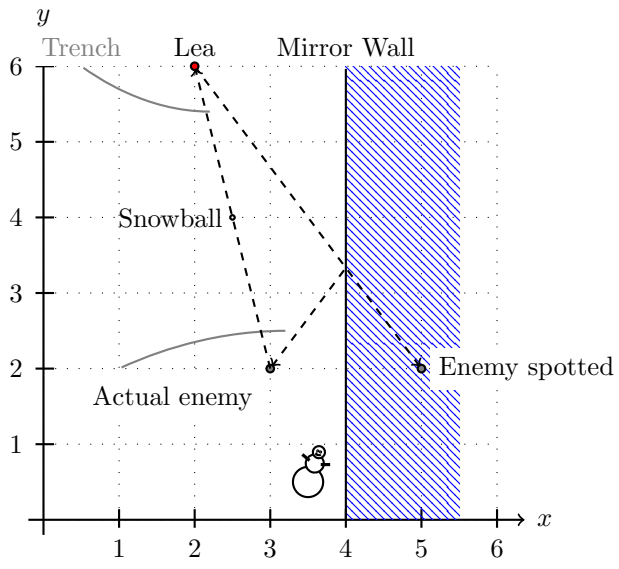

Figure 1: Illustration of the sample input, case 1.

Input

The first line of the input contains an integer t. t test cases follow, each of them separated by a blank line.

Each test case consists of 4 lines. The first line contains the integers x_{Lea} y_{Lea}, Lea's coordinates. The second line contains the doubles x_{Snow} y_{Snow}, some in-flight coordinates of one of the snowballs that came from the direction of the attacker. The third line contains the integers x_{Wall1} y_{Wall1} x_{Wall2} y_{Wall2}, the coordinates of the wall. The fourth line contains the doubles x_{enemy} y_{enemy}, the projected coordinates of the enemy she saw in the mirror.

[1] It is owned by some huge tech corporation. Lea forgot the name, but it was something like "Mirror's Ledge".

Output

For each test case, print a line containing "Case #i: x y" where i is its number, starting at 1, and (x, y) are the coordinates of the enemy. Your solution is considered correct if the area is accurate to four decimal places. Each line of the output should end with a line break.

Constraints

- $1 \leq t \leq 20$
- $y_{Wall1} = 0$
- $y_{Wall2} = 30$
- All given coordinates are between 0 and 30.
- All points are at least 10^{-4} apart.
- All points are at least 10^{-4} away from the wall.

Sample Input 1

```
1
2 6
2.5 4.0
4 0 4 30
5 2
```

Sample Output 1

```
Case #1: 3.0 2.0
```

Sample Input 2

```
5
14 10
16.5 9.5
20 0 20 30
21.0 9.0

16 15
11.5 10.0
17 0 17 30
27.0 5.0

5 13
10.0 9.5
19 0 19 30
23.0 6.0

19 19
17.0 10.5
20 0 20 30
25.0 2.0

6 17
11.0 13.0
18 0 18 30
20.0 9.0
```

Sample Output 2

```
Case #1: 19.0 9.0
Case #2: 7.0 5.0
Case #3: 15.0 6.0
Case #4: 15.0 2.0
Case #5: 16.0 9.0
```