ICPC@TUM

Templonian Excavation

Author: Christian Müller

On her visit to Templonia, Lea comes by an old Templonian temple site, which has not yet been excavated completely. Fascinated, she spends the day talking to the archaeologists that are busily scouring the area, unearthing artifacts from ancient times.

In those times in Templonia, the number 3 was a very holy number. That is why they raised many monuments to it. The excavation site Lea visited is one of them.

It consists of several altars, each of them surrounded by 3 obelisks that form a triangle. Inside that triangle, they paved the floor with triangular floor tiles and for every 3 square meters of area of the triangle they set up a 3-armed candelabra (Since the area generally was not divisible by 3, they rounded the number of square meters to the nearest multiple of 3 and since they could never have enough 3s they also rounded the resulting number of candelabras to the nearest multiple of 3). They then held mass inside these triangles where they chanted songs about the holy 3 in which 3 viciously slaughtered every other number until it was the only number left. Then, they sacrificed 3 virgins, drank 3 different kinds of religious wine and danced until morning. All in all it sounded like a big party.

While she heard about all this, she watched the archaeologists uncover the floor tiles, candelabras, goblets, etc. As she really liked the old candelabras she wanted to know how many more the archaeologists would probably find.

Input

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

Each test case consists of 6 integers: $x_1 y_1 x_2 y_2 x_3 y_3$. The points $(x_1, y_1), (x_2, y_2), (x_3, y_3)$ specify the locations of the 3 obelisks (coordinates are given in meters).

Output

For each test case, output one line containing "Case #i: *number*" where i is its number, starting at 1, and *number* is the amount of candelabras the Templonians used to illuminate their sacrificial parties. Each line of the output should end with a line break.

Constraints

- $1 \le t \le 20$

- $0 \le x_i, y_j \le 10000$

- $(x_1, y_1), (x_2, y_2), (x_3, y_3)$ are pairwise distinct

- $(x_1, y_1), (x_2, y_2), (x_3, y_3)$ form a convex area

Sample Data

Input

```
1  4
2  0 0 3 0 0 3
3  0 0 6 0 0 6
4  0 0 5 0 0 4
5  15 16 17 14 30 40
```

Output

```
1  Case #1: 3
2  Case #2: 6
3  Case #3: 3
4  Case #4: 12
```