5967 The Falling Circle

The little Jerry is now developing a game. You know developing game is a complex thing as there are many challenges involved. For example little Jerry is now stuck with some geometric pattern and asks for your help. To help him you do not need to know every detail of the game, only information of the particular frame should suffice. Here it is:

Two circles are attached with the wall. They are fixed. A line is attached to the circles in such a way that it touches both the circles and each of the touching points has lower Y coordinate than that of the corresponding center of the circle. Now another circle is dropped on the set up from above (higher Y coordinate). The circle will fall along the Y axis with a constant velocity of 1 unit per second until it touches the line. When it touches the line, it starts to rotate along the line towards the circle that has lower Y coordinate touching point with a constant angular velocity of 1 revolution per second. When it touches the circle at the end, it stops. If both the touching points have same Y coordinate, i.e. the line is parallel to the X axis, then the falling circle stops as soon as it touches the line. Now given the setup, you need to find the time after which the falling circle will stop.

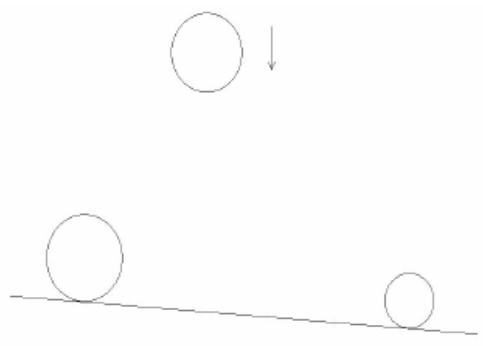

Figure 1: Initial Setup, the circle starts falling

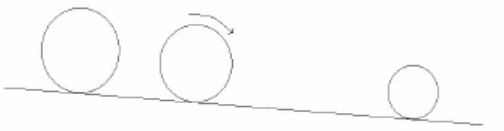

Figure 2: The circle touches the line and starts to rotate

Figure 3: The circle touches the circle in the end and stops

Input

The first line of the input will denote the number of cases T ($T \leq 10000$). Each of the test cases will contain 3 lines describing 3 circles. The first two lines will give information of the circles at the ends and the 3rd line will describe the circle that will fall. Each of the circles are described with 3 integers x, y and r ($-100000 \leq x, y \leq 100000$; $0 < r \leq 100$). You are assured that the falling circle will always touch the line first and will drop between the fixed circles. Also, note that the falling circle will not bounce, no matter what its height is.

Output

For each case output the case number and the time required in seconds. Absolute difference less than 1e-6 will be considered correct.

Sample Input

```
2
0 0 5
```

```
100 1 6
50 60 10
0 0 5
100 1 8
50 60 10
```

Sample Output

```
Case 1: 55.000000
Case 2: 56.511165
```