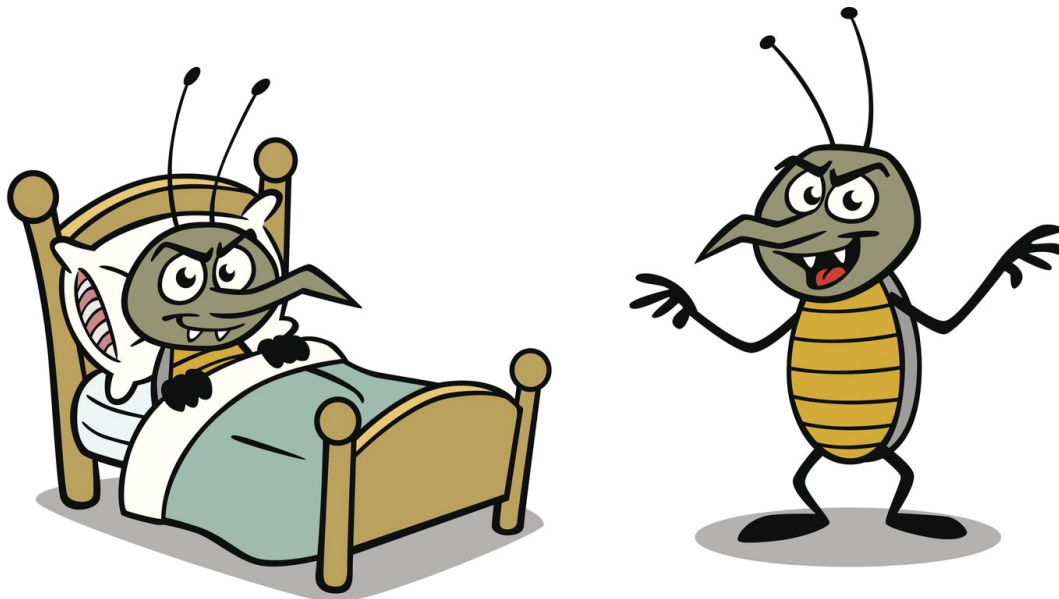


## Secret Meeting (teleport2)

Everyone knows that in Bugland rooms are an infinite plane surface in which each point is described by two coordinates  $(x, y)$ : in particular, two bugs  $A$  and  $B$  are now waiting at coordinates  $(X_a, Y_a)$  and  $(X_b, Y_b)$ . It is well known that in Bugland beds are perfect circles, described by the coordinates of their center and their radius: in particular, in the mentioned room there is a single bed with center  $C = (X_c, Y_c)$  and radius  $R$ .



$A$  and  $B$  want to have a secret meeting to plan the invasion of the room: thus, they need to move as silent as possible, according to any trajectory, and gather this way to a common meeting point  $(X_m, Y_m)$  (not necessarily of integer coordinates). Walking on the floor one unit makes 1  $NU$  (Noise Unit): for example, walking from  $(1, 1)$  to  $(3, 1)$  makes 2  $NU$ , and walking from  $(1, 1)$  to  $(3, 2)$  makes  $\sqrt{5}$   $NU$ . On the other hand, walking on the bed is completely silent. Help the two bugs  $A$  and  $B$  meet, using a path allowing the sum of their  $NU$ s to be minimal.

Among the attachments of this task you may find a template file `teleport2.*` with a sample incomplete implementation.

Warning: as this task deals with floating point numbers, it is highly recommended to use the attached templates for a correct I/O.

### Input

The first line contains one integer  $T$ , the number of scenarios that you have to solve. Each of the following  $T$  lines describe a scenario and contain seven integers:  $X_a, Y_a, X_b, Y_b, X_c, Y_c$  and  $R$ .

### Output







You need to write  $T$  lines, one for each scenario, each with a single floating point: the minimal  $NU$  made by the two bugs. The printed numbers must have **exactly** 6 decimals, rounded down.

## Constraints

- $1 \leq T \leq 10\,000$ .
- $-100\,000 \leq X_a, Y_a, X_b, Y_b, X_c, Y_c \leq 100\,000$ .
- $0 \leq R \leq 100\,000$ .
- There are no constraints on the meeting point and trajectories of the bugs!

## Scoring

Your program will be tested against several test cases grouped in subtasks. In order to obtain the score of a subtask, your program needs to correctly solve all of its test cases.

- **Subtask 1** (0 points)      Examples.  

- **Subtask 2** (10 points)       $R = 0$ .  

- **Subtask 3** (10 points)       $X_a = X_b = X_c$ .  

- **Subtask 4** (20 points)       $A, B$  and  $C$  are collinear.  

- **Subtask 5** (25 points)      The answer for every scenario is guaranteed to be an integer.  

- **Subtask 6** (35 points)      No additional limitations.  


## Examples

input	output
1 -1 0 1 0 0 3 1	2.000000

## Explanation

In the **first sample case**, the first bug is in  $(-1,0)$ , the second bug in  $(1,0)$  and the bed has radius 1 and center in  $(0,3)$ . One of the possible solution is that the two bugs meet at  $(0,0)$ .