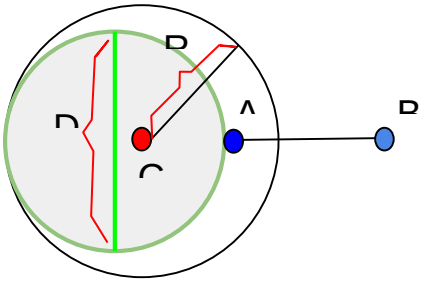
Resize the Cake

The famous **Anonymous Cake**, the most popular cake producer of this time, is one of the sponsors of the fest this year. The company authority has arranged an uncommon and interesting event. The following rules have been set for this event:

- Every time there will be a circular cake having radius R centered at an arbitrary point in the grid.
- The participant will be given a straight stick having arbitrary length.
- The participant will throw the stick towards the cake from a fixed distance.
- If the stick hits the cake,
    - the authority will resize the cake so that the cake remains in circular shape having no portion of the stick and the diameter of the cake will be ***as maximum as possible*** after resizing.
    - The authority will keep the resized cake and the excluded portion of the original cake will be given to the participant.
- If the stick does not hit the cake,
    - There is no need to resize the cake.
    - The authority will keep the whole cake.

Since, the authority keeps the resized cakes, the bigger the cakes (after resizing) are, the more profitable they are for the company. So, the authority is worried about the size (diameter) of the cake after resizing. Can you help the authority by calculating the size (diameter) of the cake after resizing?



Here,

C $(C_x, C_y)$is the center and $R$is the radius of the circular cake.

A (x_1, y_1) and B (x_2, y_2) are the two endpoints of the straight stick.

D is the diameter of the resized cake (the shadowed circle) value you have to find.

Input

The very first line of the input file contains the total number of cakes, N. The subsequent lines describe the N cakes with corresponding stick. The first line is a blank line ('**\n**'). The second line contains three space separated integers C_x, C_y and R, where (C_x, C_y) is the center and R is the radius of the cake. The third line contains four space separated integers x_1, y_1, x_2, y_2, where A (x_1, y_1) and B (x_2, y_2) are the two endpoints of the stick.

$1 \leq N \leq 500, 1 \leq R \leq 1000, -2000 \leq C_x, C_y, x_1, y_1, x_2, y_2 \leq 2000$

Output

For each of the cakes given, output one line containing the floating number which is the diameter, D of the cake that the authority wanted to know after resizing the original cake. The output should have exactly **6** digits followed by the decimal point after rounding.

Sample Input	Sample Output
2 0 0 5 4 0 5 0 0 0 5 4 0 7 3	9.000000 9.000000