Problem C. Circle

Input file:	*standard input*
Output file:	*standard output*
Time limit:	3 seconds
Memory limit:	512 mebibytes

There are two points A and B and an obstacle circle O on a Cartesian plane.

Now, you need to choose a point C on the boundary of O and then move both points A and B to point C. While moving, the path of either point A or B can only go outside circle O or touch its boundary.

Your goal is to minimize the total moving distance, that is, the sum of the moving distances of A and B.

Input

The first line contains a single integer t ($1 \le t \le 10^6$), the number of test cases.

Each test case is given on a single line and contains seven integers $x_1, y_1, x_2, y_2, x_3, y_3, r$, where $-10^3 \le x_1, y_1, x_2, y_2, x_3, y_3 \le 10^3$ and $1 \le r \le 10^3$. Here, $A = (x_1, y_1)$, $B = (x_2, y_2)$, and O is a circle centered at (x_3, y_3) with radius r. It is guaranteed that neither A nor B is strictly inside O.

Output

For each test case, output a single line with a single real number: the answer rounded to the third decimal place. It is guaranteed that the fourth decimal place is neither 4 nor 5.

Example

standard input	standard output
3 0 0 2 2 1 1 1 0 0 2 2 1 0 1 0 0 2 2 1 -1 1	3.571 2.927 3.116