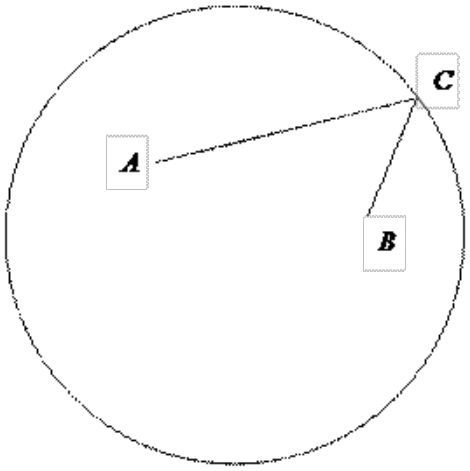
Two Little Lambs (prob13)

The Problem

Two little lambs lived in two different locations on a circular island, with a nice beach along its entire perimeter. To celebrate the Chinese New Year (Year of the Sheep), they decided to meet at a point on the beach. They also decided to meet at a point where the sum of distances from the two houses would be minimal.



The center of the circle is located at the origin. Given the radius of the circle and the coordinates of houses of the two lambs, you need to find the minimal distance sum |AC|+|BC|.

Input

The first input line consists of a positive integer *n*, the number of cases. Each of the next *n* lines contains 5 real numbers representing a test case:

```
r x1 y1 x2 y2
```

where *r* is the radius of the circle, and (*x1*, *y1*) and (*x2*, *y2*) are the coordinates of the two houses.

Output

For each input case, print the minimal sum of distances to exactly 3 decimal places, rounded.

Sample Input

```
3
10 0 0 5 0
1 0 0.5 0.5 0.5
2 -1 0 0 1
```

Sample Output

```
15.000
0.983
2.947
```