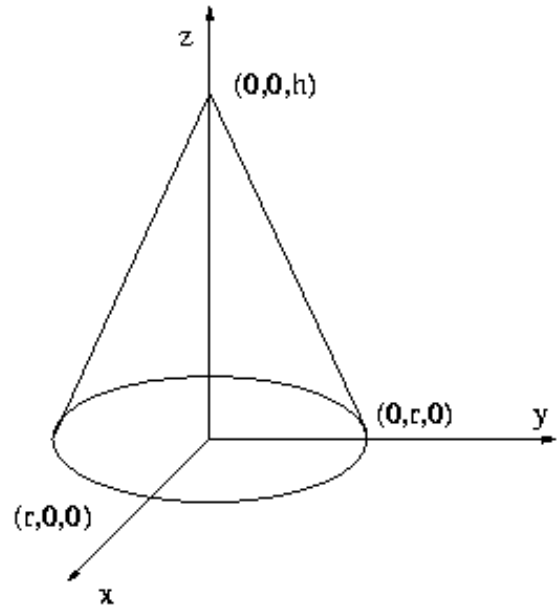
A cone is located in 3D such that its base of radius r is in the $z = 0$ plane with the center at $(0, 0, 0)$. The tip of the cone is located at $(0, 0, h)$. Two points are given on the cone surface in conic coordinates. The conic coordinates of a point p lying on the surface of the cone are two numbers: the first, d, is the distance from the tip of the cone to p and the second, $A < 360$, is the angle in degrees between the plane $y = 0$ and the plane through points $(0, 0, 0)$, $(0, 0, h)$ and p, measured counterclockwise from the direction of the x axis.



Given are two points $p_1 = (d_1, A_1)$ and $p_2 = (d_2, A_2)$ in the conic coordinates. What is the (shortest) distance between p_1 and p_2 measured on the surface of the cone?

Input

The input is a sequence of lines. Each line contains 6 floating point numbers giving values of: r, h, d_1, A_1, d_2, and A_2.

Output

For each line of input, output the (shortest) distance between points p_1 and p_2 on the surface of the cone with the fraction rounded to 2 decimal places.

Sample Input

```
3.0 4.0 2.0 0.0 4.0 0.0
3.0 4.0 2.0 90.0 4.0 0.0
6.0 8.0 2.14 75.2 9.58 114.3
3.0 4.0 5.0 0.0 5.0 90.0
```

Sample Output

```
2.00
3.26
7.66
4.54
```