

Block Pathing

time limit per test: 1 second
memory limit per test: 256 megabytes
input: standard input
output: standard output

points: 100 · problem code: blockpathing · author: glipR

You are an ant on a child's toy, and would like to find the shortest path between two points. The child's toy simply contains two objects: An axis-aligned rectangle and a circle.

You can assume that:

- The two objects don't overlap
- The two objects don't "kiss" (there is a non-zero distance between the two)

What is the shortest distance from start to finish?

Input

Input will always have the same number of values, all of which are integers, in the following form:

```
sx sy
ex ey
blx bly trx try
rad cx cy
```

Where:

- `sx` and `sy` are the x/y coordinates of the starting position
- `ex` and `ey` are the x/y coordinates of the end goal
- `blx` and `bly` are the x/y coordinates of the bottom left corner of the rectangle
- `trx` and `try` are the x/y coordinates of the top right corner of the rectangle
- `rad` is the radius of the circle
- `cx` and `cy` are the x/y coordinates of the centre of the circle

Output

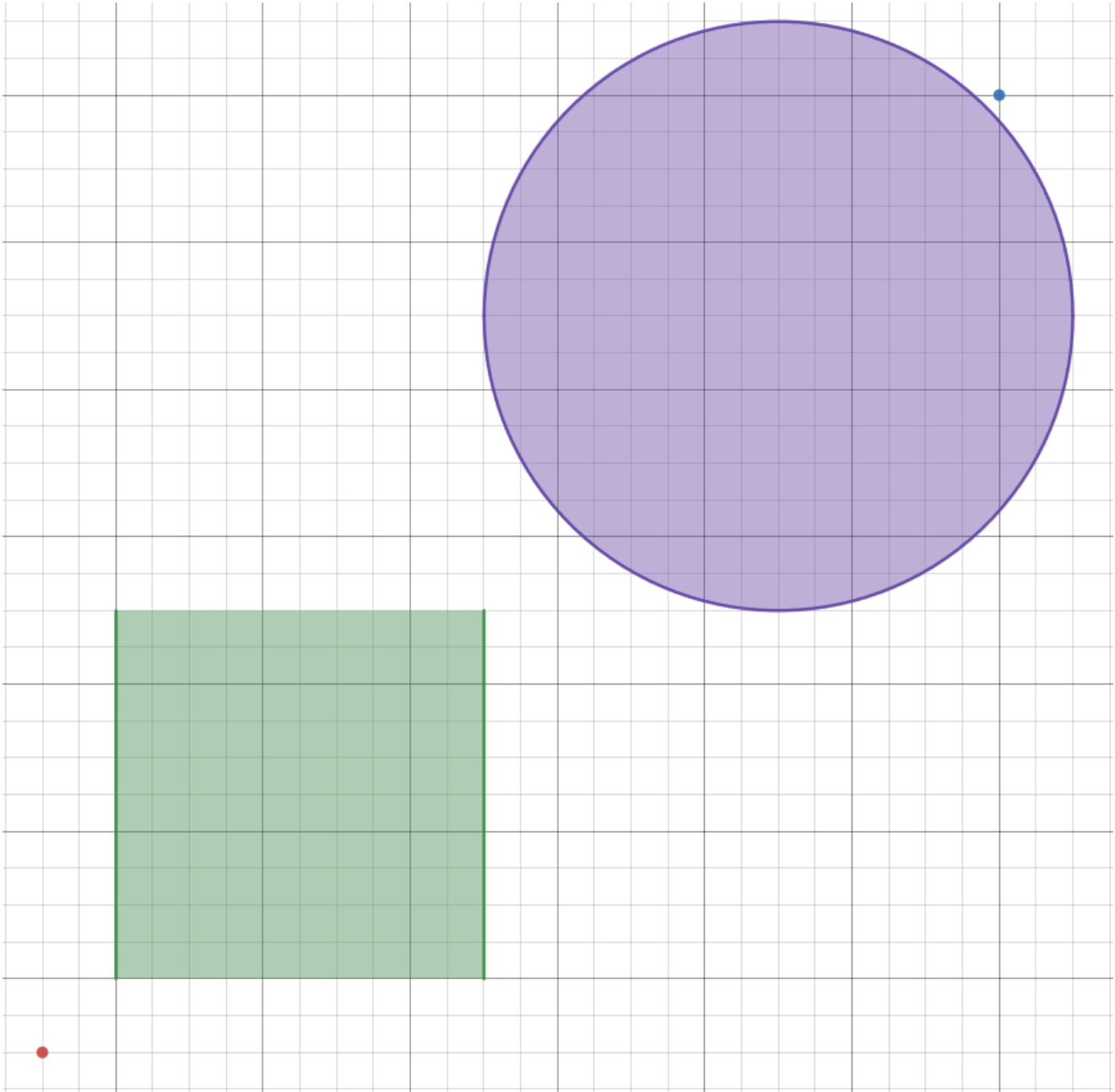
Output a single value representing the shortest distance from the start to end goal. Any answer with absolute or relative error of 10^{-6} will be considered correct.

Example

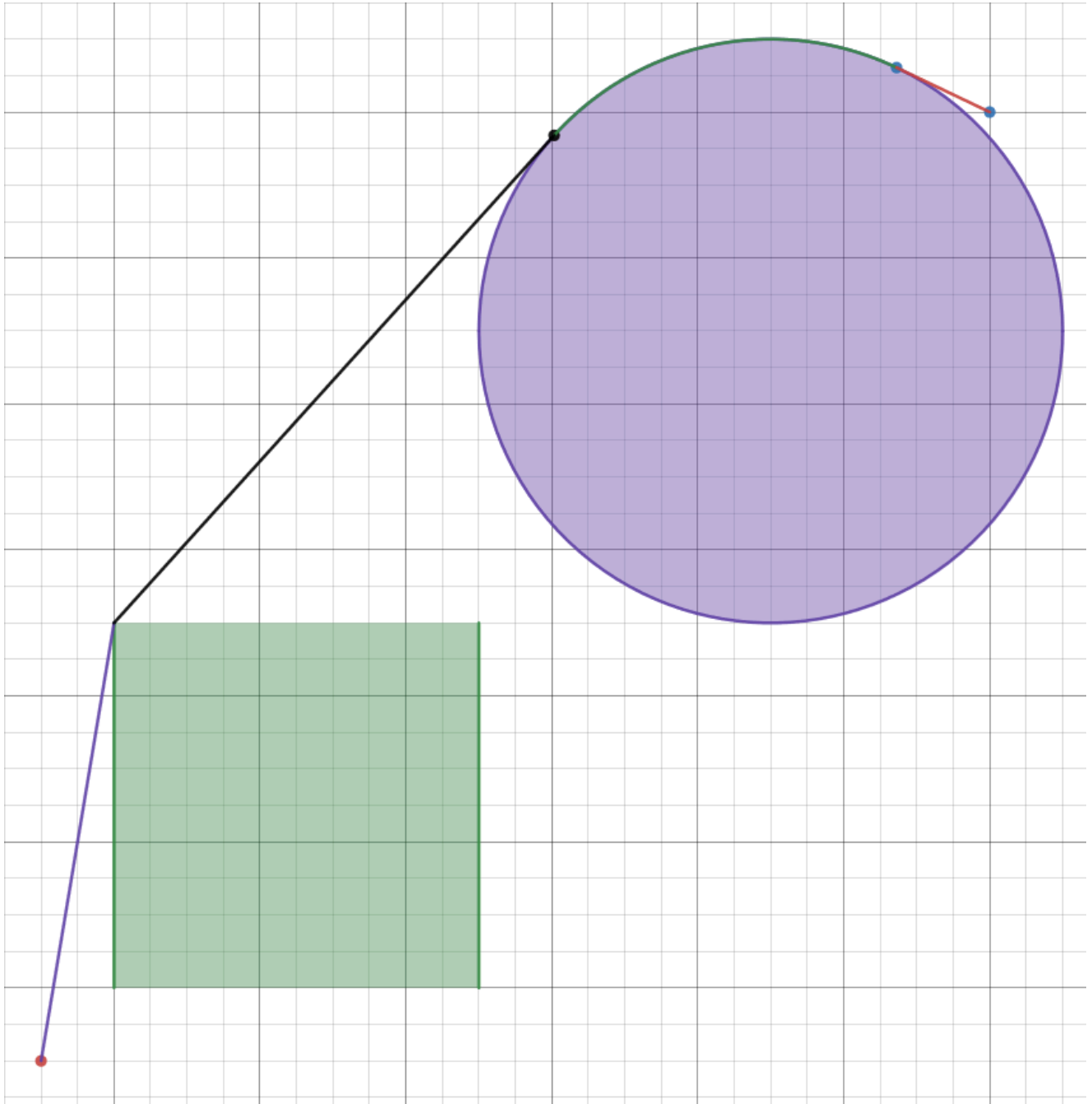
Take the following input:

```
1 1
14 14
2 2 7 7
4 11 11
```

This is represented by the following graph:



Which can be pathed in the following manner:



Resulting in a distance of

21.625015745078453

Constraints

- All values given are in the range $[0, 10^9]$