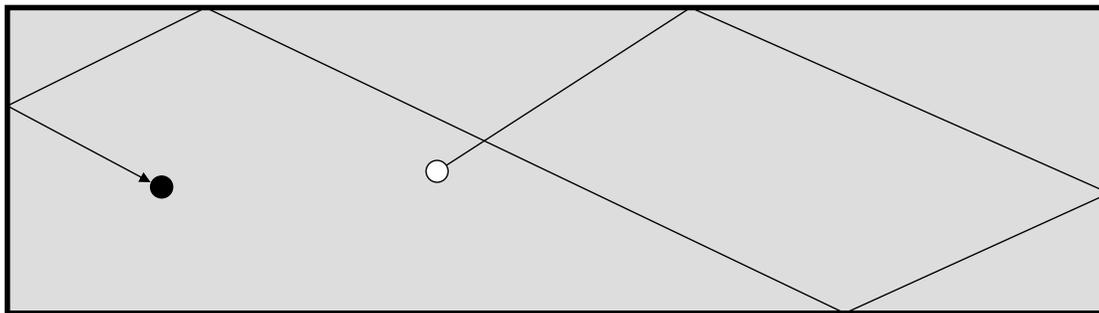




## G: Pool Table

Consider a pool table with a cue ball and a target ball. The cue ball must bounce off of a certain number of cushions (i.e. edges of the table), and then hit the target ball. What is the minimum distance that the cue ball has to travel?



Assume ideal cushions (i.e., laws of reflection apply), and a negligible ball diameter. The coordinate system uses a corner of the table as the origin, and the edges of the table are aligned with the coordinate axes. If the cue ball hits in a corner, it is considered to be hitting two cushions. The cue ball must hit *exactly* the correct number of cushions first, *before* hitting the target the ball.

### Input

There will be multiple test cases. Each case is on a single line containing seven integers:

$L$   $W$   $CX$   $CY$   $TX$   $TY$   $N$

The first two integers,  $L$  and  $W$  ( $2 \leq L, W \leq 100$ ), are the dimensions of the table. The next two pairs of integers are the coordinates  $(x, y)$  of the cue and target balls, such that  $0 < CX, TX < L$ , and  $0 < CY, TY < W$ , and  $(CX, CY)$  is not the same as  $(TX, TY)$ . The last integer  $N$ , ( $0 \leq N \leq 100$ ), is the number of cushions that must be hit. The test cases will be followed by a line with seven 0's.

### Output

For each test case, print a single decimal number, rounded (NOT truncated) to 3 decimal places, representing the shortest distance the cue ball must travel. Print each answer on its own line, with no blank lines between answers.

### Sample Input

```
20 15 10 1 12 1 1
10 20 1 2 7 16 2
0 0 0 0 0 0 0
```

### Sample Output

```
2.828
19.698
```