Different Distances

Problem ID: differentdistanc
CPU Time limit: 2 seconds
Memory limit: 1024 MB
Difficulty: 1.5

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Some people say 'The shortest distance between two points is a straight line.' However, this depends on the distance metric employed. Between points (x_1, y_1) and (x_2, y_2), the Euclidean (aka straight-line) distance is

$$\sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$$

However, other distance metrics are often useful. For instance, in a city full of buildings, it is often impossible to travel in a straight line between two points, since buildings are in the way. In this case, the so-called Manhattan (or city-block) distance is the most useful:

$$|x_1 - x_2| + |y_1 - y_2|$$

Both Euclidean and city-block distance are specific instances of what is more generally called the family of p-norms. The distance according to norm p is given by

$$(|x_1 - x_2|^p + |y_1 - y_2|^p)^{1/p}$$

If we look at Euclidean and Manhattan distances, these are both just specific instances of $p = 2$ and $p = 1$, respectively.

For $p < 1$ this distance measure is not actually a metric, but it may still be interesting sometimes. For this problem, write a program to compute the p-norm distance between pairs of points, for a given value of p.

Input

The input file contains up to $1\,000$ test cases, each of which contains five real numbers, $x_1\ y_1\ x_2\ y_2\ p$, each of which have at most 10 digits past the decimal point. All coordinates are in the range $(0, 100]$ and p is in the range $[0.1, 10]$. The last test case is followed by a line containing a single zero.

Output

For each test case output the p-norm distance between the two points (x_1, y_1) and (x_2, y_2). The answer should be accurate within 0.0001 error.

Sample Input 1

```
1.0 1.0 2.0 2.0 2.0
1.0 1.0 2.0 2.0 1.0
1.0 1.0 20.0 20.0 10.0
0
```

Sample Output 1

```
1.4142135624
2.0000000000
20.3636957882
```