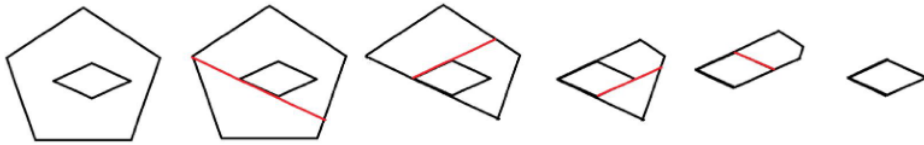


5 Laser Swords!

Ken just got a laser sword. He's smart enough to point it away from his face as he is testing it out. He wants to practice using his laser sword on some old T-shirts. To make the best use of existing material, he is re-using some of the bigger slices leftover from his previous practice sessions. There are 2 convex polygon shapes A and B . Ken is trying to carve out the smaller shape B , completely contained in the bigger shape A of cloth.

Ken would like to make a sequence of cuts to cut out B from A . To do this, Ken draws a straight line completely through A that is incident to one of the edges of B , which separates A into two pieces. Ken cuts along this line and discards the piece that doesn't contain B . He repeats this until the piece that is left is exactly B .



The cost of making a cut is equal to the length of the cut (i.e. the length of the line through the remainder of A). Given A and B , find the minimum cost needed to cut B out.

5.1 Input

Each input will consist of a single test case. Note that your program may be run multiple times on different inputs. Each test case will begin with a line containing a single integer a ($3 \leq a \leq 200$), which is the number of points in polygon A . Each of the next a lines will contain two integers x and y ($-10^6 < x, y < 10^6$), which are the vertices of polygon A , in clockwise order. It is guaranteed that polygon A will be convex.

The next line will contain a single integer b ($3 \leq b \leq 200$), which is the number of points in polygon B . Each of the next b lines will contain two integers x and y ($-10^6 < x, y < 10^6$), which are the vertices of polygon B , in clockwise order. It is guaranteed that polygon B will be convex. It is also guaranteed that polygon B will reside entirely within the interior of polygon A .

No three points, within a polygon or across polygons, will be lying in the same straight line.

5.2 Output

Output a single floating point number, accurate to 10 digits after the decimal point, which is the minimum cost to cut B out of A .

SAMPLE INPUT AND OUTPUT ON NEXT PAGE

5.3 Sample Input/Output

Sample Input 1	Sample Output 2
4 0 0 0 14 15 14 15 0 4 8 3 4 6 7 10 11 7	40.0000000000
Sample Input 2	Sample Output 2
4 -100 -100 -100 100 100 100 100 -100 8 -1 -2 -2 -1 -2 1 -1 2 1 2 2 1 2 -1 1 -2	322.1421356237