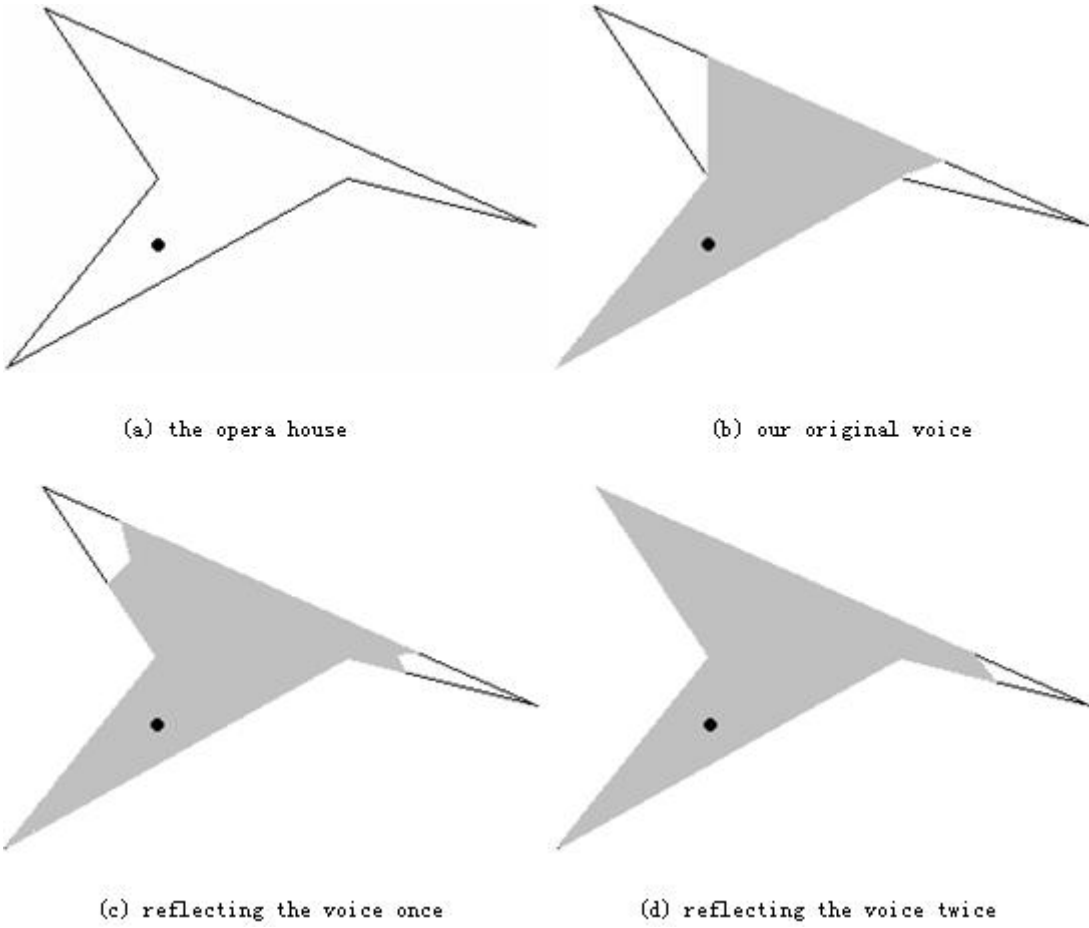


## 12309 A Strange Opera House II

Yesterday evening, I have dreamed of a strange opera house which is in the form of a simple polygon. I was standing on the stage at  $(x, y)$  singing “That’s All I Ask of You” with my girlfriend — that’s our favorite song.

The walls can reflect our voice at most  $k$  times. The following 4 figures show how our voice is reflected.



I wonder how much area in opera house could hear our song, either directly or indirectly. Can you tell me?

### Input

The input consists of at most 10 test cases. Each case contains four integers  $n$ ,  $k$ ,  $x$  and  $y$  ( $3 \leq n \leq 50$ ,  $0 \leq k \leq 5$ ), the number of vertices of the opera house, the maximal number of reflections of our voice, and the location of the stage. The stage will never be on a wall. The following  $n$  lines each contain two integers  $x_i$  and  $y_i$ , the coordinates of the vertices. The vertices are arranged either clockwise or counterclockwise. The last case is followed by a single zero, which should not be processed. All the coordinates are integers with absolute values not greater than 1000.

### Output

For each test case, print the total area of the places that could hear our song, to two decimal places.

**Sample Input**

```
5 0 100 135
20 200
200 100
300 125
40 10
100 100
8 1 25 15
0 0
0 20
30 20
30 0
20 0
20 10
10 10
10 0
0
```

**Sample Output**

```
9368.00
466.67
```