*Bever Lumber* hires beavers to cut wood. The company has recently received a shippment of tabletops. Each tabletop is a convex polygon. However, in this hard economic times of cutting costs the company has ordered the tabletops from a not very respectable but cheap supplier. Some of the tabletops have the right shape but they are slightly too big. The beavers have to chomp of a strip of wood of a fixed width from each edge of the tabletop such that they get a tabletop of a similar shape but smaller. Your task is to find the area of the tabletop after beavers are done.
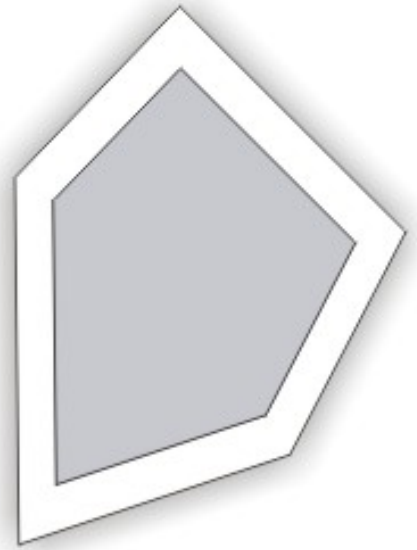
Input

Input consists of a number of cases each presented on a separate line. Each line consists of a sequence of numbers. The first number is d the width of the strip of wood to be cut off of each edge of the tabletop in centimeters. The next number n is an integer giving the number of vertices of the polygon. The next n pairs of numbers present x_i and y_i coordinates of polygon vertices for $1 \leq i \leq n$ given in clockwise order. A line containing only two zeroes terminate the input.

d is much smaller than any of the sides of the polygon. The beavers cut the edges one after another and after each cut the number of vertices of the tabletop is the same.

Output

For each line of input produce one line of output containing one number to three decimal digits in the fraction giving the area of the tabletop after cutting.

Sample Input

```
2 4 0 0 0 5 5 5 5 0
1 3 0 0 0 5 5 0
1 3 0 0 3 5.1961524 6 0
3 4 0 -10 -10 0 0 10 10 0
0 0
```

Sample Output

```
1.000
1.257
2.785
66.294
```