Problem J
Cover the Polygon with Your Disk

Input: Standard Input
Time Limit: 5 seconds

A convex polygon is drawn on a flat paper sheet. You are trying to place a disk in your hands to cover as large area of the polygon as possible. In other words, the intersection area of the polygon and the disk should be maximized.

Input

The input consists of a single test case, formatted as follows. All input items are integers.

$$
\begin{array}{l}
n\ r \\
x_1\ y_1 \\
\vdots \\
x_n\ y_n
\end{array}
$$

n is the number of vertices of the polygon ($3 \leq n \leq 10$). r is the radius of the disk ($1 \leq r \leq 100$). x_i and y_i give the coordinate values of the i-th vertex of the polygon ($1 \leq i \leq n$). Coordinate values satisfy $0 \leq x_i \leq 100$ and $0 \leq y_i \leq 100$.

The vertices are given in counterclockwise order. As stated above, the given polygon is convex. In other words, interior angles at all of its vertices are less than 180°. Note that the border of a convex polygon never crosses or touches itself.

Output

Output the largest possible intersection area of the polygon and the disk. The answer should not have an error greater than 0.0001 (10^{-4}).

Sample Input 1	**Sample Output 1**
4 4 0 0 6 0 6 6 0 6	35.759506

Sample Input 2

```
3 1
0 0
2 1
1 3
```

Sample Output 2

```
2.113100
```

Sample Input 3

```
3 1
0 0
100 1
99 1
```

Sample Output 3

```
0.019798
```

Sample Input 4

```
4 1
0 0
100 10
100 12
0 1
```

Sample Output 4

```
3.137569
```

Sample Input 5

```
10 10
0 0
10 0
20 1
30 3
40 6
50 10
60 15
70 21
80 28
90 36
```

Sample Output 5

```
177.728187
```

Sample Input 6

```
10 49
50 0
79 10
96 32
96 68
79 90
50 100
21 90
4 68
4 32
21 10
```

Sample Output 6

```
7181.603297
```