

Problem J. Cover the Polygon with Your Disk

Input file: *standard input*
Output file: *standard output*
Time limit: 3 seconds
Memory limit: 512 mebibytes

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. The first line contains n , the number of vertices of the polygon ($3 \leq n \leq 10$), and r , the radius of the disk ($1 \leq r \leq 100$). Then follow n lines with x_i and y_i which 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 degrees. 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 absolute error greater than 0.0001 (10^{-4}).

Examples

standard input	standard output
4 4 0 0 6 0 6 6 0 6	35.759506
3 1 0 0 2 1 1 3	2.113100
3 1 0 0 100 1 99 1	0.019798
4 1 0 0 100 10 100 12 0 1	3.137569
10 10 0 0 10 0 20 1 30 3 40 6 50 10 60 15 70 21 80 28 90 36	177.728187
10 49 50 0 79 10 96 32 96 68 79 90 50 100 21 90 4 68 4 32 21 10	7181.603297