7949 Enclosure Area

No one really knew how rich old Mr. Miserly really was. People used to joke about how he must own half the town, but it was not until he passed away that people discovered that he was the sole owner of the town's banks. Since most of the homes and small businesses had mortgages with those banks, he really did own half the town.

No one really knew how civic-minded Mr. Miserly really was. But the day after his will was read, the townsfolk woke to the sound of workmen hammering wooden stakes into the ground near every building that was partly owned by the banks. Each family found, in their mailbox, a small green flag and a leaflet with these instructions:

> **From:** the executors of the Miserly estate
>
> You may tie this flag to any of the wooden stakes in the town. At noon, the executors will tie strings from one flagged stake to the next, forming the shortest path they can make that encloses **all** the flagged stakes. [The high school's Geometry teacher tried to explain to people that this formed a convex polygon, but no one paid much attention.]
>
> Any building inside the perimeter will have its mortgage paid off by the Miserly estate.
>
> Furthermore, the estate will donate $1 to the Municipal Fund for every square ILMU (Imaginary Linear Measurement Unit) of area within the enclosed perimeter.

Most of the townsfolk never got as far as reading the final paragraph before rushing off to place their flag near their home or family business.

You, however, held on to your flag. You now have the last flag. You can see that your own home is safe, surrounded by the flags of your neighbors. So your thoughts turn to the donation to the Municipal Fund. You want to place your flag where it will increase the enclosed area to the largest possible value.

Input

The input file contains several test cases, each of them as described below.

The first line of input contains two integers n and k, where n is the number of stakes in the forest and k is the number of stakes with flags already tied to them. $3 \leq k < n \leq 100,000$

The next n lines each have two integers x and y, $-1,000,000,000 \leq x, y \leq 1,000,000,000$, specifying the location of each stake, measured in ILMUs. The first k of these are the stakes already flagged by the townspeople.

- Assume that any two stakes can be joined by a straight length of string, ignoring any possible interference from buildings, trees, or other physical objects.
- There may be unflagged stakes both within and without the current perimeter.
- No three stakes will occupy co-linear locations.

Output

For each test case, print a single line containing a floating point number denoting the maximum area you can achieve by gaining flagging one additional stake. Print this to one decimal place of precision.

Sample Input

```
10 9
4 3
3 8
7 9
8 1
9 9
1 0
9 2
10 4
5 3
7 1
```

Sample Output

```
58.5
```