Problem H. Meeting Places

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	1024 megabytes

Welcome to the 2022 ICPC(International Collegiate Programming Contest) Taoyuan Regional Contest!

ICPC is an algorithmic programming competition for university students. It is designed to showcase university students' creativity, teamwork, and ability to write codes, analyze, and solve problems under pressure.

This year, there are N problem setters(numbering from 1 to N) for Taoyuan regional contest.

In order to make the quality of the whole competition better, the problem setters held several meetings during the preparation.

And how to choose the meeting place is a very important thing, because it is necessary to consider the residence of the problem setters.

For convenience, the organizer divided the problem setters into K groups. Each group is composed of consecutively numbered problem setters, and each problem setter will only appear in one group.

For the same group of problem setters, there will be the same meeting place, and the cost of this group is defined as the farthest distance from the members of the group to the meeting place.

Now, you know the location of N problem setters (as a point on a two-dimensional Cartesian coordinate), and K, can you find the minimum sum of costs for these K groups?

The distance here refers to the Euclidean distance, which means that for two points $(x_1, y_1), (x_2, y_2)$, the distance between them is $\sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$

This question may be a bit difficult for you, in addition, you unexpectedly discover a piece of information, and you don't know if it's useful. That is, the residence of each problem setter will satisfy the certain formula. In the other words, the N points are generated by the following formula:

$X_i = Y_{i-1} \times 233811181 + 1(\mathrm{mod}(2^{31} - 1)), \forall i \geq 2.$
$Y_i = X_i \times 233811181 + 1(\mathrm{mod}(2^{31} - 1)), \forall i \geq 1.$

The above stories are purely fictitious, and any coincidences are purely similar.

Input

The first line contains three integers, N, K, X_1, which represent the number of points, the number of intervals, and the random seed.

Constraints

- $1 \leq K \leq N \leq 2000$.
- $1 \leq X_1 \leq 8831$

Output

Output one floating point which represents the minimum value of the sum of the radii of the smallest enclosing circles in the K segments.

Your answer will be considered correct if its absolute or relative error on both coordinates does not exceed 10^{-6}. Formally let your answer be a, jury answer be b. Your answer will be considered correct if $\frac{|a-b|}{max(1,|b|)} \leq 10^{-6}$.

Examples

standard input	standard output
100 23 213	1319350480.8007326126