7072 Signal Interference

Two countries A-Land and B-Land are at war. The territory of A-Land is a simple polygon with no more than 500 vertices. For military use, A-Land constructed a radio tower (also written as A), and it's so powerful that the whole country was under its signal. To interfere A-Land's communication, B-Land decided to build another radio tower (also written as B). According to an accurate estimation, for any point P, if the euclidean distance between P and B is no more than k ($0.2 \leq k < 0.8$) times of the distance between P and A, then point P is not able to receive clear signals from A, i.e. be interfered. Your task is to calculate the area in A-Land's territory that are under B-Land's interference.

Input

There are no more than 100 test cases in the input.

In each test case, firstly you are given a positive integer N indicating the amount of vertices on A-Land's territory, and an above mentioned real number k, which is rounded to 4 digits after the decimal point.

Then N lines follow. Each line contains two integers x and y ($|x|, |y| \leq 1000$), indicating a vertex's coordinate on A's territory, in counterclockwise or clockwise order.

The last two lines of a test case give radio tower A and B's coordinates in the same form as vertexes' coordinates. You can assume that A is not equal to B.

Output

For each test case, firstly output the case number, then output your answer in one line following the format shown in sample. Please note that there is a blank after the ':'.

Your solution will be accepted if its absolute error or relative error is no more than 10^{-6}.

This problem is special judged.

Sample Input

```
4 0.5000
-1 -1
1 -1
1 1
-1 1
0 0
-1 0
```

Sample Output

```
Case 1: 0.2729710441
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