Problem B
Garbage Remembering Exam
Input: Standard Input
Output: Standard Output

Little Tim is now a graduate, and is thinking about higher studies. However, he first needs to appear in an exam whose preparation alone includes memorizing the meanings of over 3500 words!

After going through the list a few times, however, he sees trouble – he can remember all the word-meanings as long as they keep coming in the same order. When quizzed in random order, however, he is at a complete loss. So, as any decent programmer would, he writes a random shuffler to help him quiz himself.

To his dismay, however, he finds that words that were near each other in the original list quite often end up being close together in the shuffled list as well. He does not like this at all, and suspects that his random shuffler may have some kind of a bug. But before he recodes his shuffler he wants your help to make sure that the shuffler is indeed faulty.

So he is asking for your help in determining how likely such events are even if the list is indeed getting completely randomly shuffled, and even if his program is working perfectly.

Given the size of the list *N*, and a proximity factor *K*, you are to determine the expected number of *wasted words* in a shuffled list assuming that all possible shufflings are equally likely. Informally, two words are considered *wasted* if they appear at a distance less than or equal to *K* in both the lists. Assume that the original list is *cyclical* and shuffled list is *linear* (non-cyclical).

Formally, let us suppose that two words A and B have indices o_a and o_b in the original list and indices s_a and s_b in the shuffled list, respectively (all indices are 0-based). Then both the words are considered *wasted* if:

$$|s_a - s_b| \leq K \text{ and } ((o_a - o_b) \bmod N \leq K \text{ or } (o_b - o_a) \bmod N \leq K)$$

Input

The input consists of a series of cases. Each case consists of two integers *N* and *K* on a single line. You may assume that $1 \leq K \leq N \leq 100000$. Input is terminated by a line containing two 0s, and has at most 125 lines of input.

Output

Output one line for each test case except the last one. Each line of output should be of the form "Case X: Y", where X is the serial number of output and Y is the expected number of wasted words in the shuffled list, printed with exactly four digits after the decimal point, with rounding if necessary.

Sample Input

Sample Input	Output for Sample Input
5 2 5 1 0 0	Case 1: 5.0000 Case 2: 3.5000