

Random Permutation

Input file: **standard input**
Output file: **standard output**
Time limit: **1 second**
Memory limit: **512 megabytes**

An integer sequence with length n , denoted by a_1, a_2, \dots, a_n , is generated randomly, and the probability of being $1, 2, \dots, n$ are all $\frac{1}{n}$ for each a_i ($i = 1, 2, \dots, n$).

Your task is to calculate the expected number of permutations p_1, p_2, \dots, p_n from 1 to n such that $p_i \leq a_i$ holds for each $i = 1, 2, \dots, n$.

Input

The only line contains an integer n ($1 \leq n \leq 50$).

Output

Output the expected number of permutations satisfying the condition. Your answer is acceptable if its absolute or relative error does not exceed 10^{-9} .

Formally speaking, suppose that your output is x and the jury's answer is y . Your output is accepted if and only if $\frac{|x-y|}{\max(1,|y|)} \leq 10^{-9}$.

Examples

standard input
2
standard output
1.000000000000
standard input
3
standard output
1.333333333333
standard input
50
standard output
104147662762941310907813025277584020848013430.758061352192