Problem J. Jack and Jill

Input file:	*standard input*
Output file:	*standard output*
Time limit:	1 second
Memory limit:	64 mebibytes

There are n males and n females who participate in a dance competition. The competition is held according to the following rules:

1. Initially males and females are randomly matched into n couples, and all the couples are arranged in a circle.
2. The judge flips a coin and determines the number k, which is either 1 or 2 with equal probability. After that, another flip of a coin determines either "clockwise" or "counter-clockwise" direction, also with equal probability.
3. In accordance with coin flips on the previous step, females switch partners by moving on the circle by k positions in the corresponding direction (while males remain in place).
4. If, after moving, a female matches a male with whom she already danced in one of the previous rounds, the competition ends, and judges determine the winners. Otherwise, the current couples dance a round, judges carefully evaluate them, and then the process goes to step 2.

Determine the expected number of rounds which will be danced during the competition.

Input

A single line containing integer n ($2 \le n \le 50$).

Output

Output the answer with accuracy 10^{-9}.

Examples

standard input	standard output
3	2.5000000000000000000
5	3.2187500000000000000