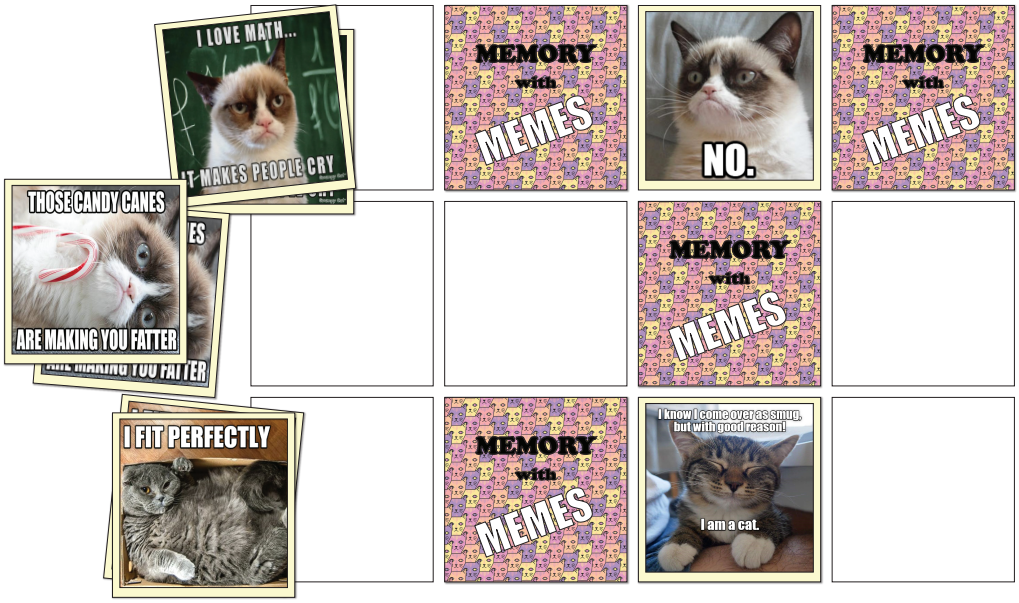
Problem C: Memory with Memes

Peter loves playing *Memory with Memes* with his friends. *Memory with Memes* is a card game played with $2n$ cards where there are n pairs of cards that have matching cat memes on them. In the beginning of the game all cards are placed on the table with the cat memes facing down. In each round a player turns up two cards, one after the other (visible to everybody) and if they show the same cat meme they are both removed from the game and that player scores a point. Otherwise they are placed back face down. The game ends once all cards have been removed from the game.

Peter is very good at *Memory with Memes*, in fact he is so good that he always remembers every card that was turned up during the entire game. While this is good for his winning chances, it also means that none of his friends want to play with him anymore! Because of this, Peter has taken to playing on his own and tries to complete the game using as few rounds as possible. If he plays his cards right, what is the expected number of rounds needed to clear all the cards off the table? Remember that each round the two cards are turned up one at a time, so Peter picks the second card only after seeing the meme on the first.



Input

The input consists of one line with one integer n ($1 \leq n \leq 1\,000$), the number of pairs of cards.

Output

Output one line with one number, the expected number of rounds needed to complete the game when following a perfect strategy. Your output will be accepted if the absolute or relative error does not exceed 10^{-6}.

Sample Input 1

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2
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Sample Output 1

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2.666666666667
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Sample Input 2

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4
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Sample Output 2

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5.923809523810
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