

The Ball Game

Taru and Hanaku play a ball game. The game is played with N white balls, N black balls and N boxes. Hanaku chooses one box randomly and one ball from it randomly. Taru has to arrange the balls in such a way that the probability of Hanaku choosing a White ball is maximised. None of the boxes after the arrangement should be empty. Your task is to find that maximum probability.

Input

The first line contains the number of test cases (T) followed by T lines each an integer N .

Output

For each test case output the maximum probability of getting a white ball which is possible with an arrangement for the above configuration. Print the answer rounded to 8 decimal places.

Constraints

$T \leq 20$

$N \leq 1000$

Example

Sample Input:

1
1

Sample Output:

0.50000000