IMPRESS HER

Romeo bought N beautiful roses for juliet. Each rose has a unique beauty coefficient C, 1<=C<=N. Juliet hates number 3 but loves increasing sequences. Juliet will be impressed if the arrangement of roses doesn't contain increasing sequence of beauty coefficients of length >= 3. Given N , find the probability that Romeo will impress Juliet.

Input Format :
First line of input file contains T, number of test cases. Next T lines contain N , number of roses in each line.

Output Format :
Print the result, correct to 6 places after decimal point.

Constrainsts:
To be decided after testing.

Sample Input:
2
2
3

Sample Output:
1
0.833333

Explanation:
1.We cannot have a increasing sequence of length >= 3 with just 2 flowers

2. Out of all the arrangements, Juliet will be unimpressed by the arrangement 123 only.