Problem G

Birthday Party

N persons have been invited to a somewhat special birthday party. Each person brings one present, but the recipent of each present is determined randomly. A person never receives his own present, but all other persons are equally likely recipients. What is the probability that one can find k persons at the party such that person 1 gives his present to person 2, person 2 gives his present to person 3 and so on to person k which gives his present to person 1?

Input specifications

The first line of the input consists of a single integer T, the number of test cases. Each test case consists of two integers N and k.

Output specifications

For each test case, output the probability with an accuracy of at least 10^{-6}.

Notes and Constraints

- $0 < T \leq 30$
- $2 \leq N \leq 10000000$
- $2 \leq k \leq N$

Sample input

```
4
2 2
3 2
3 3
10 3
```

Output for sample input

```
1.000000000
0.750000000
0.250000000
0.313469843
```