Round 1A 2009

A. Multi-base happiness

B. Crossing the Road

C. Collecting Cards

Contest Analysis

Questions asked 1

Submissions

Multi-base happiness

9pt | Not attempted **1955/2202 users** correct (89%)

18pt | Not attempted **481/1714 users** correct (28%)

Crossing the Road

13pt | Not attempted **213/429 users** correct (50%)

20pt | Not attempted **172/239 users** correct (72%)

Collecting Cards

10pt | Not attempted **390/868 users** correct (45%)

30pt | Not attempted **311/377 users** correct (82%)

Top Scores

LayCurse	100
TripleM	100
Eryx	100
austrin	100
ivan.popelyshev	100
krijgertje	100
neal.wu	100
AS1	100
Ahyangyi	100
crazyb0y	100

Problem C. Collecting Cards

This contest is open for practice. You can try every problem as many times as you like, though we won't keep track of which problems you solve. Read the Quick-Start Guide to get started.

Small input 10 points	Solve C-small
Large input 30 points	Solve C-large

Problem

You've become addicted to the latest craze in collectible card games, PokeCraft: The Gathering. You've mastered the rules! You've crafted balanced, offensive, and defensive decks! You argue the merits of various cards on Internet forums! You compete in tournaments! And now, as they just announced their huge new set of cards coming in the year 2010, you've decided you'd like to collect every last one of them! Fortunately, the one remaining sane part of your brain is wondering: how much will this cost?

There are **C** kinds of card in the coming set. The cards are going to be sold in "booster packs", each of which contains **N** cards of different kinds. There are many possible combinations for a booster pack where no card is repeated. When you pay for one pack, you will get any of the possible combinations with equal probability. You buy packs one by one, until you own all the **C** kinds. What is the expected (average) number of booster packs you will need to buy?

Input

The first line of input gives the number of cases, **T**. **T** test cases follow, each consisting of a line containing **C** and **N**.

Output

For each test case, output one line in the form

```
Case #x: E
```

where **x** is the case number,starting from 1, and **E** is the expected number of booster packs you will need to buy. Any answer with a relative or absolute error at most 10^{-5} will be accepted.

Limits

$1 \le \mathbf{T} \le 100$

Small dataset

$1 \le \mathbf{N} \le \mathbf{C} \le 10$

Large dataset

$1 \le \mathbf{N} \le \mathbf{C} \le 40$

Sample

Input	Output
2 2 1 3 2	Case #1: 3.0000000 Case #2: 2.5000000


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