

Submissions

What are Birds?

5pt	Not attempted 115/168 users correct (68%)
12pt	Not attempted 78/114 users correct (68%)

Apocalypse Soon

8pt	Not attempted 17/41 users correct (41%)
14pt	Not attempted 7/13 users correct (54%)

Millionaire

13pt	Not attempted 29/52 users correct (56%)
16pt	Not attempted 15/28 users correct (54%)

Modern Art Plagiarism

7pt	Not attempted 137/147 users correct (93%)
25pt	Not attempted 17/32 users correct (53%)

Top Scores

ACRush	100
Ahyangyi	100
Amber	78
xhl.kogitsune	78
LayCurse	75
xreborner	71
stone	62
TripleM	62
wata	61
tckwok	53

Problem C. Millionaire

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
13 points

Solve C-small

Large input
16 points

Solve C-large

Problem

You have been invited to the popular TV show "Would you like to be a millionaire?". Of course you would!

The rules of the show are simple:

- Before the game starts, the host spins a wheel of fortune to determine **P**, the probability of winning each bet.
- You start out with some money: **X** dollars.
- There are **M** rounds of betting. In each round, you can bet any part of your current money, including none of it or all of it. The amount is not limited to whole dollars or whole cents.

If you win the bet, your total amount of money increases by the amount you bet. Otherwise, your amount of money decreases by the amount you bet.

- After all the rounds of betting are done, you get to keep your winnings (this time the amount is rounded down to whole dollars) only if you have accumulated \$1000000 or more. Otherwise you get nothing.

Given **M**, **P** and **X**, determine your probability of winning at least \$1000000 if you play optimally (i.e. you play so that you maximize your chances of becoming a millionaire).

Input

The first line of input gives the number of cases, **N**.

Each of the following **N** lines has the format "**M P X**", where:

- **M** is an integer, the number of rounds of betting.
- **P** is a real number, the probability of winning each round.
- **X** is an integer, the starting number of dollars.

Output

For each test case, output one line containing "Case #**X**: **Y**", where:

- **X** is the test case number, beginning at 1.
- **Y** is the probability of becoming a millionaire, between 0 and 1.

Answers with a relative or absolute error of at most 10^{-6} will be considered correct.

Limits

$1 \leq \mathbf{N} \leq 100$
 $0 \leq \mathbf{P} \leq 1.0$, there will be at most 6 digits after the decimal point.
 $1 \leq \mathbf{X} \leq 1000000$

Small dataset

$1 \leq \mathbf{M} \leq 5$

Large dataset

$1 \leq \mathbf{M} \leq 15$

Sample

Input	Output
2	Case #1: 0.500000
1 0.5 500000	Case #2: 0.843750
3 0.75 600000	

In the first case, the only way to reach \$1000000 is to bet everything in the single round.

In the second case, you can play so that you can still reach \$1000000 even if you lose a bet. Here's one way to do it:

- You have \$600000 on the first round. Bet \$150000.
- If you lose the first round, you have \$450000 left. Bet \$100000.
- If you lose the first round and win the second round, you have \$550000 left. Bet \$450000.
- If you win the first round, you have \$750000 left. Bet \$250000.
- If you win the first round and lose the second round, you have \$500000 left. Bet \$500000.

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