

# Ping Pong Probability

Two Ping Pong players agree to play several games. The players are evenly matched. However, the person serving first has a probability  $p$  of winning that game. A serves the first game and thereafter the loser serves first. What is the Probability that A wins the  $n$ th game?

## Input

Number of test cases  $T$  followed by  $T$  lines of ' $n$ ' - the number of games played; and ' $p$ ' probability of person serving first winning.

$0 < T < 100$

## Output

Print for each test case the probability of A winning.

Please print a *double* value.

## Example

**Input:**

2

4 0.7

7 0.7

**Output:**

0.4872

0.500819