Project Euler #227: The Chase

This problem is a programming version of Problem 227 from projecteuler.net

"The Chase" is a game played with two m-sided equiprobable dice and an even number of players.

The players sit around a table; the game begins with two opposite players having one die each. On each turn, the two players with a die roll it.
If a player rolls a 1, he passes the die to his neighbour on the left; if he rolls an m, he passes the die to his neighbour on the right; otherwise, he keeps the die for the next turn.
The game ends when one player has both dice after they have been rolled and passed; that player has then lost.

In a game with n players, what is the expected number of turns the game lasts? It can be proved that the answer is alsways rational, thus it can be represented as $\frac{p}{q}$ with natural coprime p and q. Give your answer as $p \times q^{-1} \pmod{10^9 + 9}$. It is guaranteed that q is coprime with $10^9 + 9$.

Input Format

Each test file contains one line with 2 integers separated by single spaces: n and m.

Constraints

- $2 \leq n \leq 10^6$
- n is even
- $4 \leq m \leq 100$

Output Format

Print exactly one integer number that is the answer to the problem.

Sample Input 0

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6 6
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Sample Output 0

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113636380
```

Explanation 0

The real answer is $\frac{675}{44}$. One could easily check that $675 \times 44^{-1} = 113636380 \pmod{10^9 + 9}$.