Problem I
Counting Necklaces

A necklace is consisted of **N** identical beads and your job is to color the beads. Note that, in necklace the beads are arranged circularly, that is – first bead is adjacent to second bead, second bead is adjacent to third one, …, last one is adjacent to first one. Each bead should be colored with exactly one color and you have **K different** types of colors available. Now a coloring of the necklace is considered *beautiful* if for any three adjacent beads **all of them have different colors**.

Given three integers **N, K** and **M**: find how many different *beautiful* colorings are possible for an **N**-bead necklace where you have **K different** types of colors available. Output the result **modulo M (%M)**. Two ways of coloring are considered different if it is not possible to have same color sequence of beads **by rotation**. For example, when N = 4, K = 4, "1234", "2341","3412" and "4123" are all same.

Input

First line of the input contains an integer **T (T <= 100)** which is the number of test cases. Each of the following **T** lines contain three integers **N ($3 <= N <= 10^8$)**, **K ($1 <= K <= 10^8$)** and **M ($2 <= M <= 10^8$)**.

Output

For each test case, output the case number, followed by the number of *beautiful* colorings **modulo M (%M)**.

Sample Input	Output for Sample Input
3 4 4 10000000 3 3 1000007 8 10 100000	Case 1: 6 Case 2: 2 Case 3: 99160

For the first case, the different ways are: "1234", "1324", "1423", "1243", "1342", "1432".

For the second case, the different ways are: "213" and "123".

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