Problem H
Fair Problemset
Time Limit: 8 Seconds

This problem adopts exactly the same definition of *Fair Problemset* as Problem M, "Triple Fairness".

ICPC is a team competition. Each team has three members. At the beginning of a contest, most teams divide the $3n$ problem evenly. They use one of two common methods to distribute problems:

1. **Sequential Distribution**: Each member takes a contiguous block of n problems from the set of $3n$ problems. Specifically, the first member takes problems $1, \cdots, n$, the second member takes problems $n+1, \cdots, 2n$, and the third member takes problems $2n+1, \cdots, 3n$.
2. **Jump Distribution**: Each member takes problems with indices that have the same remainder when divided by 3 from the set of $3n$ problems. Specifically, the first member takes problems $1, 4, 7, \cdots, 3n-2$, the second member takes problems $2, 5, 8, \cdots, 3n-1$, and the third member takes problems $3, 6, 9, \cdots, 3n$.

The ICPC Seoul Regional Contest Scientific Committee must prepare a problemset consisting of $3n$ problems. The difficulty of each problem is represented by an integer from 1 to n, inclusive. For each difficulty, there are exactly three problems with that difficulty. Thus, the arrangement of difficulties in the problemset can be viewed as a *difficulty sequence* of length $3n$ containing three problems of each of the n difficulty levels.

To prevent any advantage or disadvantage for a team based on their chosen problem distribution method, the ICPC Seoul Regional Contest Scientific Committee has defined a standard called a *Fair Problemset*. A difficulty sequence of length $3n$ is called a Fair Problemset if it satisfies both of the following conditions:

1. **Sequential Distribution Fairness**: When using Sequential Distribution, for every difficulty level i $(1 \le i \le n)$, each of the three members receives exactly one problem with difficulty i.
2. **Jump Distribution Fairness**: When using Jump Distribution, for every difficulty level i $(1 \le i \le n)$, each of the three members receives exactly one problem with difficulty i.

In other words, regardless of which of the two methods is chosen, each team member must be assigned exactly one problem for each difficulty level from 1 to n, inclusive.

Given a positive integer k, write a program to find the number of Fair Problemset sequences of length $3n$ for each $n = 1, 2, \cdots, k$.

Input
Your program is to read from standard input. The input consists of exactly one line. The line contains two integers, k and m ($1 \le k \le 10^6$; $10^8 < m < 10^9$; m is a prime number).

Output
Your program is to write to standard output. You should print exactly k lines. On the n-th line $(1 \le n \le k)$, print the number of Fair Problemset sequences of length $3n$, modulo m.

The following shows sample input and output for two test cases.

Sample Input 1	Output for the Sample Input 1
2 993244853	1 2

Sample Input 2	Output for the Sample Input 2
3 998244353	1 2 12

Explanation of Sample Input 2:

Here are 12 Fair Problemset sequences of length 9 ($= 3 \times 3$).

i. 1 2 3 2 3 1 3 1 2
ii. 1 2 3 3 1 2 2 3 1
iii. 1 3 2 2 1 3 3 2 1
iv. 1 3 2 3 2 1 2 1 3
v. 2 1 3 1 3 2 3 2 1
vi. 2 1 3 3 2 1 1 3 2
vii. 2 3 1 1 2 3 3 1 2
viii. 2 3 1 3 1 2 1 2 3
ix. 3 1 2 1 2 3 2 3 1
x. 3 1 2 2 3 1 1 2 3
xi. 3 2 1 1 3 2 2 1 3
xii. 3 2 1 2 1 3 1 3 2