

# Problem F. Polynomial

Time limit 4000 ms

Memory limit 256MB

## Problem Description

You are given three integers  $N, X, M$ . Define the sequence

$$S(N, X) = N + (N - 1)X + (N - 2)X^2 + \dots + X^{N-1}$$

Your task is to compute

$$S(N, X) \mod M$$

## Input format

The first line contains a integer  $Q (1 \leq Q \leq 10^6)$  - the number of test cases.

Each of the following  $Q$  lines contains three integers  $N, X, M (1 \leq N, X \leq 10^{18}, 2 \leq M \leq 10^9)$ .

## Output format

For each test case, output a single integer - the value of  $S(N, X) \mod M$ .

## Subtask score

Subtask	Score	Additional Constraints
1	7	The sum of $N$ does not exceed $10^6$
2	21	$M$ is prime
3	36	$Q \leq 2000$
4	27	$Q \leq 2 \times 10^5$
5	9	No additional constraints

## Sample

### Sample Input 1

```
3
3 2 5
4 1 10
5 10 24
```

### Sample Output 1

```
1
0
9
```

### Sample Input 2

```
3
3 2 13
4 1 17
5 10 23
```

**Sample Output 2**

```
11
10
17
```