

# Cheese and Random Toppings

*Waiter:* Good day, sir! What would you like to order?  
*Lucas:* One Cheese & Random Toppings (CRT) pizza for me, please.  
*Waiter:* Very good, sir. There are  $N$  toppings to choose from, but you can choose only  $R$  toppings.  
*Lucas:* Hmm, let's see...

...Then Lucas started writing down all the ways to choose  $R$  toppings from  $N$  toppings in a piece of napkin. Soon he realized that it's impossible to write them all, because there are a lot. So he asked himself: **How many ways are there to choose exactly  $R$  toppings from  $N$  toppings?**

Since Lucas doesn't have all the time in the world, he only wished to calculate the answer **modulo  $M$** , where  $M$  is a squarefree number whose prime factors are each less than  $50$ .

Fortunately, Lucas has a Wi-Fi-enabled laptop with him, so he checked the internet and discovered the following useful links:  
[Lucas' theorem](#)  
[Chinese remainder theorem \(CRT\)](#)

## Input Format

The first line of input contains  $T$ , the number of test cases. The following lines describe the test cases.  
Each test case consists of one line containing three space-separated integers:  $N$ ,  $R$  and  $M$ .

## Constraints

$1 \leq T \leq 200$   
 $1 \leq M \leq 10^9$   
 $1 \leq R \leq N \leq 10^9$   
 $M$  is squarefree and its prime factors are less than  $50$

## Output Format

For each test case, output one line containing a single integer: the number of ways to choose  $R$  toppings from  $N$  toppings, modulo  $M$ .

## Sample Input

```
6
5 2 1001
5 2 6
10 5 15
20 6 210
13 11 21
10 9 5
```

## Sample Output

```
10
4
12
120
15
0
```

## Explanation

*Case 1 and 2:* Lucas wants to choose 2 toppings from 5 toppings. There are ten ways, namely (assuming the toppings are **A**, **B**, **C**, **D** and **E**):

**AB, AC, AD, AE, BC, BD, BE, CD, CE, DE**

Thus,

*Case 1:*  $10 \bmod 1001 = 10$

*Case 2:*  $10 \bmod 6 = 4$

*Case 6:* We can choose 9 toppings from 10 by removing only one from our choice. Thus, we have ten ways and  $10 \bmod 5 = 0$