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

 $1 \leq T \leq 200$

 $1 \leq M \leq 10^9$

 $1 \le R \le N \le 10^9$

 $m{M}$ is squarefree and its prime factors are less than $m{50}$

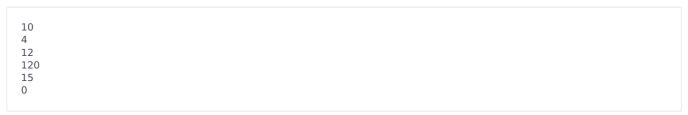
Output Format

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



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: $10 \mod 1001 = 10$

Case 2: $10 \mod 6 = 4$

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