

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 $10 \bmod 5 = 0$