

## The number of numbers

**Time limit: 2 seconds**

**Memory limit: 15 MB**

Little Mojo hates the Powerpuff girls - hates them to the core. He hates the fact every single one of those girls has a huge number denoting their power constant. Here are their respective powers:  $A1^d$ ,  $A2^d$ , and  $A3^d$ .

**Equation #13:**  $A1^d + A2^d + A3^d \equiv m \pmod{N}$ .

Little Mojo wants to find out the exact power units he would need to defeat the powerpuff girls. To find that out, he would need the number of solutions of equation #13, such that they satisfy the following constraints:

$0 \leq A1, A2, A3 \leq \text{Upper Limit}$  - for the given values of exponential (d), modulo(m) and N. Since, the answer might be very large, you have to find out the answer modulo  $10^9 + 7$ .

**PS: A1, A2, A3 are integers.**

### Input Format:

The first line denotes the number of test cases. Every test case consists of four numbers, Upper Limit, d, m and N.

### Output Format:

For every test case, you have to output the answer containing the number of solutions for the corresponding equation, modulo  $10^9 + 7$ .

### Constraints:

$1 \leq \text{Number of Test Cases} \leq 10$

$1 \leq \text{Upper Limit} \leq 1,000,000,000$

$0 \leq d \leq 1,000,000,000$

$1 \leq N \leq 40$

$0 \leq m < N$

$0^0$  is considered as 1 for this question.

**Sample Input:**

3  
2 2 3 5  
1 2 3 4  
2 3 2 3

**Sample Output:**

4  
1  
9