Tracy and Charlie

Tracy is teaching Charlie maths via a game called N-Cube, which involves three sections involving N.

Tracy gives Charlie a number N, and Charlie makes a list of Nth powers of integers in increasing order (1^N, 2^N, 3^N.. so on). This teaches him exponentiation.

Then Charlie performs the following subtraction game N times : Take all pairs of consecutive numbers in the list and take their difference. These differences then form the new list for the next iteration of the game. Eg, if N was 6, the list proceeds as [1, 64, 729, 4096 ...] to [63, 685, 3367 ...], and so on 5 more times.

After the subtraction game, Charlie has to correctly tell Tracy the Nth element of the list. This number is the *value of the game*.

After practice Charlie became an expert in the game. To challenge him more, Tracy will give two numbers **M** (where M is a prime) and **R** instead of just a single number N, and the game must start from M^R - **1** instead of N. Since the *value of the game* can now become large, Charlie just have to tell the largest integer K such that M^K divides this number. Since even K can be large, output K modulo 1000000007 (10^9+7).

INPUT:
First line will contain **T**, number of testcases. Then the testcases follow
Each testcase contains of a single line of input, two integers **M R**

OUTPUT:
For each testcase, output in a single line answer given by Charlie to Tracy modulo 1000000007.

CONSTRAINTS:
1<=T<=1000
2<=M<=10^9
1<=R<=10^9
M is a prime number

SAMPLE INPUT:
1
2 2

SAMPLE OUTPUT:
1

EXPLANATION:
This list is : [1,8,27,64,125..] -> [7,19,37,61..] -> [12,18,24..] -> [6,6,6..]. Number of times 2 divides 6 is 1. Hence the answer is 1.