Given N, A and B, find the value of the following expression:

$$\sum_{i=1}^{N}\sum_{j=1}^{N} gcd(A^i - B^i, A^j - B^j)$$

Since the value can be large, find it modulo (10^9+7).

Input

- **The first line of the input contains an integer T denoting the number of test cases. The description of T test cases follows.**
- **Each test case consists of a single line containing three space-separated integers — A, B, and N.**

Output

- **For each test case, output a single line containing the value of the expression modulo 10^9+7.**

Constraints

- **1 ≤ T ≤ 20**
- **1 ≤ N ≤ 10^9**
- **1 ≤ B < A ≤ 10^9**
- **GCD(A,B) = 1, i.e., A and B are coprime.**

Example

Input:

2

3 2 2

2 1 2

Output:

8

6