Funny Modular Sequence

Lets define a funny modular sequence as a sequence such that a_1 x a_2=1 (mod p), a_2 x a_3=1 (mod p) ..., a_{n-1} x a_n = 1 (mod p). Also, a_1, a_2, a_3, ... a_n must be less than p and greater than or equal to 0. Given one element, **a_1**, find the sum of the entire funny modular sequence **of length n**. If, for any a_i, where i>=1, there exists no a_{i+1} such that a_ix a_{i+1} = 1 (mod p), output **-1**.

Note: p is not necessarily prime.

Input:

The first line contains **T**, the number of test cases.
T lines follow, each containing **a_1, p, and n**.

Output:

For each test case, output one line, the required sum.

Constraints:

$1<=T<=10^5$

$1<=a_1<=10^5$

$1<=n<=10^9$

$a_1 < p <=10^9$

Sample Input:

2

2 3 2

3 7 2

Sample Output:

4

8

Explanation

In the first test case, the funny modular sequence will be 2, 2, which has a sum of 4.

In the second test case, it will be 3, 5, which has a sum of 8.