Problem K. Divisibility

Time limit	2000 ms
Mem limit	262144 kB
OS	Windows

Given three integers a, b and d, find minimum non-negative integer k such that:

- $a.b^k$ is divisible by d
- $a + (b.k)$ is divisible by d

If such number doesn't exist print -1.

You have to answer t independent test cases.

Input

The first line contains one integer t ($1 \leq t \leq 10^5$) — the number of queries.

Then q lines follow, each containing three integer a_i, b_i and $d_i (1 \leq a_i, b_i, d_i \leq 10^9)$

Output

For each query print one integer: the answer to this query.

If the answer does not exist, print -1.

Sample 1

Input	Output
6 12 1 4 2 6 12 4 2 8 2 4 8 9 3 27 2 6 64	0 -1 2 -1 6 21