Problem G – Gatuno's Descent into Psychopathy

The once-kind feline *Gatuno* is a very good and heart-guided person. As every good person, his goodness can be measured. He carries a heart of size H_1. Unfortunately, now he seeks to shed his humanity. His twisted goal: reduce his heart to size H_2 or smaller through a horrifying ritual — biting innocent dogs.

Each bite comes at a terrible cost to his remaining conscience, but makes subsequent bites easier in his dark transformation...

After biting n dogs, the rule of shrinking heart is:

- His heart shrinks: $H_n = H_1 \times \left(\frac{B-1}{B}\right)^n$ Therefore, each subsequent bite requires $\frac{1}{B}$ of the previous emotional pain.

Help Gatuno to find the minimum **minimum number of dogs** Gatuno must bite to reduce his heart size to H_2 or smaller.

Input

The input consists of multiple test cases.

The first line contains an integer T ($1 \leq T \leq 10^5$).

Each of the next T lines describes one test case with three space-separated integers:

- H_1: Initial heart size ($1 < H_1 \leq 10^{12}$) — Yes, Gatuno was a **really good** feline - H_2: Target heart size ($0 < H_2 < H_1$) - B: Brutality factor ($2 \leq B \leq 2 \times 10^5$)

Output

For each test case, output a single integer — the **minimum number of dogs** Gatuno must bite to reduce his heart size to H_2 or smaller.

Sample input 1	**Sample output 1**
3 100 50 2 1000 1 10 1000 100 10	1 66 22