Building a Fence

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	512 megabytes

There is a flower bed that was recently arranged in the yard of Nikodim's house. The neighbor's dogs often ran through the flower bed, and Nikodim decided to protect the flowers. He planned to put a small fence around the flower bed.

In the store "All for garden" you can buy a plastic section of a fence. Each section has a length s.

After the purchase, if the customer wants, the salespersons can cut some initial sections into **exactly** two smaller sections of any size (not necessarily integer length). The new sections can not be cut again. Different initial sections can be cut into new sections of different length.

The flower bed is a rectangle of size $w \times h$. Nikodim wants to make a fence of exactly this size. To do that, each side of the rectangle should be represented as a sum of some sections (each section can be used at most once). Note that it is not necessary to use all parts of sections.

Determine the minimum number of sections of length s he should buy.

Input

The first line contains a single integer t ($1 \le t \le 10^4$) — the number of test cases.

Each of the next t lines contains three integers w, h, s ($1 \le w, h, s \le 10^8$) – the dimensions of the flower bed and the length of the section.

Output

For each test case, print the minimum number of sections of length s Nikodim should buy to build the fence.

Example

standard input	standard output
7 7 9 4 1 1 2 1 1 4 4 6 2 3 3 5 10 6 4 1 11 5	8 2 4 10 4 8 5

Note

In the first test case, 8 sections should be bought. After that, two sections can be divided into smaller sections of length 1 and 3. After that, fence can be built: two times $7 = 4 + 3$ and two times $9 = 4 + 4 + 1$.