

## C. Turtle Fingers: Count the Values of k

time limit per test: 5 seconds

memory limit per test: 256 megabytes

input: standard input

output: standard output

You are given three **positive** integers  $a$ ,  $b$  and  $l$  ( $a, b, l > 0$ ).

It can be shown that there always exists a way to choose **non-negative** (i.e.  $\geq 0$ ) integers  $k$ ,  $x$ , and  $y$  such that  $l = k \cdot a^x \cdot b^y$ .

Your task is to find the number of distinct possible values of  $k$  across all such ways.

### Input

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

The following  $t$  lines contain three integers,  $a$ ,  $b$  and  $l$  ( $2 \leq a, b \leq 100$ ,  $1 \leq l \leq 10^6$ ) — description of a test case.

### Output

Output  $t$  lines, with the  $i$ -th ( $1 \leq i \leq t$ ) line containing an integer, the answer to the  $i$ -th test case.

### Example

input	Copy
11	
2 5 20	
2 5 21	
4 6 48	
2 3 72	
3 5 75	
2 2 1024	
3 7 83349	
100 100 1000000	
7 3 2	
2 6 6	
17 3 632043	
output	Copy
6	
1	
5	
12	
6	
11	
24	
4	
1	
3	
24	

### Note

In the first test case,  $a = 2$ ,  $b = 5$ ,  $l = 20$ . The possible values of  $k$  (and corresponding  $x$ ,  $y$ ) are as follows:

- Choose  $k = 1$ ,  $x = 2$ ,  $y = 1$ . Then  $k \cdot a^x \cdot b^y = 1 \cdot 2^2 \cdot 5^1 = 20 = l$ .
- Choose  $k = 2$ ,  $x = 1$ ,  $y = 1$ . Then  $k \cdot a^x \cdot b^y = 2 \cdot 2^1 \cdot 5^1 = 20 = l$ .
- Choose  $k = 4$ ,  $x = 0$ ,  $y = 1$ . Then  $k \cdot a^x \cdot b^y = 4 \cdot 2^0 \cdot 5^1 = 20 = l$ .
- Choose  $k = 5$ ,  $x = 2$ ,  $y = 0$ . Then  $k \cdot a^x \cdot b^y = 5 \cdot 2^2 \cdot 5^0 = 20 = l$ .
- Choose  $k = 10$ ,  $x = 1$ ,  $y = 0$ . Then  $k \cdot a^x \cdot b^y = 10 \cdot 2^1 \cdot 5^0 = 20 = l$ .
- Choose  $k = 20$ ,  $x = 0$ ,  $y = 0$ . Then  $k \cdot a^x \cdot b^y = 20 \cdot 2^0 \cdot 5^0 = 20 = l$ .

### Codeforces Round 929 (Div. 3)

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[brute force](#) [number theory](#)

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### → Contest materials

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In the second test case,  $a = 2, b = 5, l = 21$ . Note that  $l = 21$  is not divisible by either  $a = 2$  or  $b = 5$ . Therefore, we can only set  $x = 0, y = 0$ , which corresponds to  $k = 21$ .

In the third test case,  $a = 4, b = 6, l = 48$ . The possible values of  $k$  (and corresponding  $x, y$ ) are as follows:

- Choose  $k = 2, x = 1, y = 1$ . Then  $k \cdot a^x \cdot b^y = 2 \cdot 4^1 \cdot 6^1 = 48 = l$ .
- Choose  $k = 3, x = 2, y = 0$ . Then  $k \cdot a^x \cdot b^y = 3 \cdot 4^2 \cdot 6^0 = 48 = l$ .
- Choose  $k = 8, x = 0, y = 1$ . Then  $k \cdot a^x \cdot b^y = 8 \cdot 4^0 \cdot 6^1 = 48 = l$ .
- Choose  $k = 12, x = 1, y = 0$ . Then  $k \cdot a^x \cdot b^y = 12 \cdot 4^1 \cdot 6^0 = 48 = l$ .
- Choose  $k = 48, x = 0, y = 0$ . Then  $k \cdot a^x \cdot b^y = 48 \cdot 4^0 \cdot 6^0 = 48 = l$ .

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