

L. Congruence Equation

time limit per test: 3 seconds

memory limit per test: 256 megabytes

input: standard input

output: standard output

Given an integer x . Your task is to find out how many positive integers n ($1 \leq n \leq x$) satisfy

$$n \cdot a^n \equiv b \pmod{p},$$

where a, b, p are all known constants.

Input

The only line contains four integers a, b, p, x ($2 \leq p \leq 10^6 + 3$, $1 \leq a, b < p$, $1 \leq x \leq 10^{12}$). It is guaranteed that p is a prime.

Output

Print a single integer: the number of possible answers n .

Examples

input	Copy
2 3 5 8	
output	Copy
2	
input	Copy
4 6 7 13	
output	Copy
1	
input	Copy
233 233 10007 1	
output	Copy
1	

Note

In the first sample, we can see that $n = 2$ and $n = 8$ are possible answers.

Topic Stream Mashup: Number Theory

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Language: GNU G++17 7.3.0 ▼

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