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 ($1 \le n \le x$) 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 ($2 \le p \le 10^6 + 3$, $1 \le a, b < p$, $1 \le x \le 10^{12}$). 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.