A student called Slon is very mischievous in school. He is always bored in class and he is always making a mess. The teacher wanted to calm him down and "tame" him, so he has given him a difficult mathematical problem.

The teacher gives Slon an arithmetic expression A, the integer P and M. Slon has to answer the following question: "What is the **minimal non-negative** value of variable x in expression A so that the remainder of dividing A with M is equal to P?". The solution will always **exist**.

Additionally, it will hold that, if we apply the **laws of distribution** on expression A, variable x will not multiply variable x (formally, the expression is a polynomial of the first degree in variable x).

Examples of valid expressions A: $5 + x * (3 + 2)$, $x + 3 * x + 4 * (5 + 3 * (2 + x - 2 * x))$.
Examples of invalid expressions A: $5 * (3 + x * (3 + x))$, $x * (x + x * (1 + x))$.

INPUT

The first line of input contains the expression A ($1 \leqslant |A| \leqslant 100\,000$).
The second line of input contains two integers P ($0 \leqslant P \leqslant M - 1$) i M ($1 \leqslant M \leqslant 1\,000\,000$).
The arithmetic expression A will only consists of characters +, -, *, (,), x and digits from 0 to 9.
The brackets will always be paired, the operators +, - and * will always be applied to exactly two values (there will not be an expression (-5) or (4+-5)) and all multiplications will be explicit (there will not be an expression 4(5) or 2(x)).

OUTPUT

The first and only line of output must contain the minimal non-negative value of variable x.

SAMPLE TESTS

input	**input**	**input**
5+3+x 9 10	20+3+x 0 5	3*(x+(x+4)*5) 1 7
output	**output**	**output**
1	2	1

Clarification of the first example: The remainder of dividing $5 + 3 + x$ with 10 for $x = 0$ is 8, and the remainder of division for $x = 1$ is 9, which is the solution.