COCI '15 Contest 3 #4 Slon

Time limit: 0.6s **Memory limit:** 64M

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

Input Specification

The first line of input contains the expression A $(1 \leq |A| \leq 100\,000)$.
The second line of input contains two integers P $(0 \leq P \leq M-1)$, M $(1 \leq M \leq 1\,000\,000)$.
The arithmetic expression A will only consist 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 Specification

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

Sample Input 1

```
5+3+x
9 10
```

Sample Output 1

```
1
```

Explanation for Sample Output 1

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.

Sample Input 2

```
20+3+x
0 5
```

Sample Output 2

```
2
```

Sample Input 3

```
3*(x+(x+4)*5)
1 7
```

Sample Output 3

```
1
```