

## 7196 Find $x$

You have to implement a simple equation solver to evaluate expressions consisting of numbers, variables, and addition/subtraction operators.

In the past, this type of problem was called a “find  $x$ ” problem, however, an unintended consequence of ubiquitous touch interfaces resulted in people fruitlessly pointing at the “ $x$ ” on the screen, so we now require the unnecessarily complex syntax specified below to avoid this all-too-common misunderstanding.

### Input

Your input consists of an arbitrary number of records, but no more than 100. Each record starts with a line containing a single integer  $n$ , with  $3 \leq n \leq 32$ , denoting the number of symbols to follow, followed on the next line by  $n$  single-character symbols, separated by a single space.

The symbols are selected from the following classes:

- *NUM* : Numbers, the characters ‘0’ through ‘9’. All numbers specified in the input will be singledigit values;
- *EQ* : Equals, the character ‘=’;
- *VAR* : Variables, the characters ‘a’ through ‘z’ (only lowercase), one of which will appear exactly once in any given equation;
- *OP* : Operators, the characters ‘+’ and ‘-’. An operator may appear as the first symbol in an equation, or the first symbol after an *EQ* symbol — in this case it acts as a unary operator, which negates the *NUM* or *VAR* immediately to its right if the *OP* is ‘-’, and does nothing if the *OP* is ‘+’.

Valid equation syntax is

$$[OP] (NUM|VAR) (OP (NUM|VAR))^* EQ [OP] (NUM|VAR) (OP (NUM|VAR))^*$$

with the constraint that any given equation will contain only one instance of *VAR* (only one letter, appearing at only one place). In the syntax, parentheses denote grouping, the **Or** symbol ‘|’ denotes a choice between its left and right operands, the square brackets ‘[]’ indicate zero or one occurrences of the enclosed term), and the ‘\*’ symbol indicates zero or more occurrences of the term to its left.

The end of input is indicated by a line containing only the value ‘-1’.

### Output

For each input record, output

$$VAR = answer$$

where *VAR* is the symbol used in the input equation, and answer is the solution to the equation.

### Sample Input

```
7
4 - 5 - x = 2
8
```

$$-4 - 5 - y = 2$$

9

$$+4 - 5 - z = +2$$

8

$$+4 - 5 = a + 2$$

9

$$+4 - 5 = -d + 2$$

-1

### Sample Output

$$x = -3$$

$$y = -11$$

$$z = -3$$

$$a = -3$$

$$d = 3$$