# 4211 - Bases

**Latin America - South America - 2008/2009**

What do you get if you multiply 6 by 9? The answer, of course, is 42, but only if you do the calculations in base 13.

Given an integer $B \geq 2$, the *base B numbering system* is a manner of writing integers using only digits between 0 and $B$ -1, inclusive. In a number written in base $B$, the rightmost digit has its value multiplied by 1, the second rightmost digit has its value multiplied by $B$, the third rightmost digit has its value multiplied by $B^2$, and so on.

Some equations are true or false depending on the base they are considered in. The equation 2+2=4, for instance, is true for any $B \geq 5$ - it does not hold in base 4, for instance, since there is no digit '4' in base 4. On the other hand, an equation like 2+2=5 is never true.

Write a program that given an equation determines for which bases it holds.

## Input

Each line of the input contains a test case; each test case is an equation of the form "`EXPR=EXPR`", where both "`EXPR`" are arithmetic expressions with at most 17 characters.

All expressions are valid, and contain only the characters '`+`', '`*`' and the digits from '`0`' to '`9`'. No expressions contain leading plus signs, and no numbers in it have leading zeros.

The end of input is indicated by a line containing only "=".

## Output

For each test case in the input your program should produce a single line in the output, indicating for which bases the given equation holds.

If the expression is true for infinitely many bases, print "`B+`", where $B$ is the first base for which the equation holds.

If the expression is valid only for a finite set of bases, print them in ascending order, separated by single spaces.

If the expression is not true in any base, print the character '`*`'.

| Sample input | Output for the sample input |
|---|---|
| `6*9=42`<br>`10000+3*5*334=3*5000+10+0`<br>`2+2=3`<br>`2+2=4`<br>`0*0=0`<br>`=` | `13`<br>`6 10`<br>`*`<br>`5+`<br>`2+` |

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