

12145 Bases

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

```
6*9=42
10000+3*5*334=3*5000+10+0
2+2=3
2+2=4
0*0=0
=
```

Sample Output

```
13
6 10
*
5+
2+
```