Webster defines *prime* as:

> **prime** (*prīm*) *n.* [**ME**, fr. **MF**, fem. of *prin* first, **L** *primus*; akin to **L** *prior*] **1**: first in time: **original 2 a**: having no factor except itself and one ⟨3 is a ∼ number⟩ **b** : having no common factor except one ⟨12 and 25 are relatively ∼⟩ **3 a**: first in rank, authority or significance: **principal b**: having the highest quality or value ⟨∼ television time ⟩ [from *Webster's New Collegiate Dictionary*]

The most relevant definition for this problem is 2a: An integer $g > 1$ is said to be *prime* if and only if its only positive divisors are itself and one (otherwise it is said to be *composite*). For example, the number 21 is composite; the number 23 is prime. Note that the decompositon of a positive number g into its prime factors, i.e.,

$$g = f_1 \times f_2 \times \cdots \times f_n$$

is unique if we assert that $f_i > 1$ for all i and $f_i \leq f_j$ for $i < j$.

One interesting class of prime numbers are the so-called *Mersenne* primes which are of the form $2^p - 1$. Euler proved that $2^{31} - 1$ is prime in 1772 — all without the aid of a computer.

Input

The input will consist of a sequence of numbers. Each line of input will contain one number g in the range $-2^{31} < g < 2^{31}$, but different of -1 and 1. The end of input will be indicated by an input line having a value of zero.

Output

For each line of input, your program should print a line of output consisting of the input number and its prime factors. For an input number $g > 0$, $g = f_1 \times f_2 \times \cdots \times f_n$, where each f_i is a prime number greater than unity (with $f_i \leq f_j$ for $i < j$), the format of the output line should be

g `=` f_1 `x` f_2 `x ... x` f_n

When $g < 0$, if $|\, g \,| = f_1 \times f_2 \times \cdots \times f_n$, the format of the output line should be

g `= -1 x` f_1 `x` f_2 `x ... x` f_n

Sample Input

```
-190
-191
-192
-193
-194
195
196
197
198
199
200
0
```

Sample Output

```
-190 = -1 x 2 x 5 x 19
-191 = -1 x 191
-192 = -1 x 2 x 2 x 2 x 2 x 2 x 2 x 3
-193 = -1 x 193
-194 = -1 x 2 x 97
195 = 3 x 5 x 13
196 = 2 x 2 x 7 x 7
197 = 197
198 = 2 x 3 x 3 x 11
199 = 199
200 = 2 x 2 x 2 x 5 x 5
```