ECOO '18 R2 P3 - Factorial

Time limit: 13.0s **Memory limit:** 256M

The factorial of a number N, denoted as $N!$, is equal to the product of all natural numbers up to and including N. For example,

- $1! = 1$
- $2! = 1 \times 2 = 2$
- $3! = 1 \times 2 \times 3 = 6$
- $4! = 1 \times 2 \times 3 \times 4 = 24$

Given two numbers K and M, what is the smallest value of N such that $N!$ has at least M factors of K (that is, K^M divides evenly into $N!$)?

Input Specification

The standard input contains 10 datasets. Each dataset contains two integers K, M $(2 \leq K \leq 1\,000\,000, 1 \leq M \leq 1\,000\,000)$.

For the first 4 cases, K is prime and $K \times M \leq 1\,000$.

For the first 7 cases, $K \times M \leq 1\,000\,000$.

Output Specification

For each dataset, output the minimum value of N such that $N!$ has at least M factors of K.

Sample Input (Five Datasets Shown)

```
2 2
2 3
3 1
4 2
10 10
```

Sample Output

```
4
4
3
6
45
```