ECOO '18 R2 P3 - Factorial

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 Specifications

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

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

For the first 7 cases, $K * M \leq 1{,}000{,}000$.

Output Specifications

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
```