ICPC NAQ 2016 G - Inverse Factorial

Time limit: 0.6s **Memory limit:** 1G

ICPC North America Qualifier 2016, Problem G

A factorial $n!$ of a positive integer n is defined as the product of all positive integers smaller than or equal to n. For example,

$$21! = 1 \cdot 2 \cdot 3 \cdot \cdots \cdot 21 = 51\,090\,942\,171\,709\,440\,000$$

It is straightforward to calculate the factorial of a small integer, and you have probably done it many times before. In this problem, however, your task is reversed. You are given the value of $n!$ and you have to find the value of n.

Input Specification

The input contains the factorial $n!$ of a positive integer n. The number of digits of $n!$ is at most 10^6.

Output Specification

Output the value of n.

Sample Input 1

```
120
```

Sample Output 1

```
5
```

Sample Input 2

```
51090942171709440000
```

Sample Output 2

```
21
```

Sample Input 3

```
108888694504183521607680000000
```

Sample Output 3

```
27
```