Scientific notation can be used to express floating-point numbers accurately. The representation of scientific notation is given as follows:

$$x = a.bbbbbbE \pm c$$

When conducting experiments, it is quite often to calculate the value p^k, where $0 \leq p \leq 1$ denotes event probability, and k is the number of times the event occurred. For not losing the precision, we can use scientific notation to express the value p^k so that

$$p^k = a.bbbbbbE \pm c.$$

A special method for any integer $b = \frac{1}{p}$ is to divide one by b for k times. Whenever the quotient is less than one, multiply the quotient by 10 until it is greater than or equal to one. Every time the quotient is multiplied by 10, the power c, starting from zero, should be subtracted by one. Write a program to calculate the value p^k according to above method.

Input

The input contains several cases and ends with EOF. Each case contains two integer values, which in turn represent b and k.

Output

For each case, output the probability value p^k in scientific notation.

Sample Input

2 10
3 7

Sample Output

2^-10 = 9.765625E-4
3^-7 = 4.572474E-4