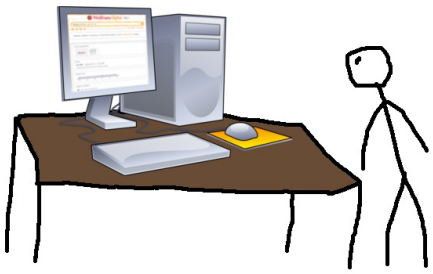
TLE '17 Contest 7 P3 - Countless Calculator Computations

Leon likes to play with calculators whenever he gets bored in class. Such fascinating devices! One day, an intriguing problem occurred to him:

> *If the equation $X^{X^{X^{X^{\cdots}}}} = Z$ contains Y number of X's, then given the values of Y and Z, what is the approximate value of X?*

Leon is tasked with Q queries regarding this problem. Apparently, he didn't perform these *countless calculator computations* well *enough*.

Can you help him?



Leon is using a very powerful calculator.

Input Specification

The first line contains integer Q $(1 \leq Q \leq 20\,000)$, the number of queries.

The following Q lines each contain two space-separated integers Y_i $(2 \leq Y_i \leq 100)$ and Z_i $(1 \leq Z_i \leq 2^{32} - 1)$.

Output Specification

For each query, output the approximate value of X_i on its own line, accurate within an absolute error of 10^{-5}.

For 50% of the points, X_i may be accurate within an absolute error of 10^{-1}.

Sample Input

```
3
100 2
50 14
3 16
```

Sample Output

```
1.414213562
1.4484039
1.99999
```