Internal Nodes

A unique b-ary tree is what you have, you want to find the non leaf nodes of this tree.

Definition of an unique b-ary tree, every node has zero or b children and level x only starts to fill if level x-1 has been fully filled. The tree is a **complete b-ary tree** up to level x−1,if it's maximum level is x, but the last level x may not be fully filled.

Input

The first line contains a number which describes how many testcases you will have t ($1 \leq t \leq 1e5$)
In each line of the testcase you will have two numbers n ($2 \leq n \leq 1e12$) and b ($1 \leq b*n \leq 1e18$)
n for the number of nodes in the tree and b that describes the amount of children each node has if any.

Output

For each testcase output the number of non leaf nodes the tree described would have.

Sample Input and Output

2 7 3 6 5	2 1