Problem 1: Twenty Questions

In the game of "twenty questions" I think of an item (like a fish) from a set of N items, and you get to ask me at most twenty questions that can only be answered "yes" or "no" to identify the item. For example, you might ask "Is it living?" If I answer "yes," then you might ask, "Does it have fur?" If I answer "no," then you might then ask, "Does it have fins?" This continues until you either guess the item (in which case you win), or you've asked twenty questions without identifying the item (in which case I win).

With just 20 questions you could identify any one of 524,288 items, assuming you can distinguish among them by asking 19 "yes/no" questions and then with your 20th question ask, "Is it X?" Of course it might take fewer than 20 questions if you have a good idea about the identity of the item, but in this problem we'll assume all the questions are used.

Suppose you could ask questions that could be answered with more than just a "yes" or "no." For example, suppose you could ask, "Does it weight less than, equal to, or greater than 10 pounds?" This question has three possible answers. Then how many questions would you need to ask in order to distinguish among N items?

In this problem you will be told how many different answers can be given to each of your questions, and the number of items in the set of possible choices for the item. All you need to do is determine the maximum number of questions that must be asked to identify the item. This assumes that your questions are chosen in such a way as to divide the remaining candidates for the item into suitably sized groups.

Input
There will be multiple cases to consider. For each case there will be two integers in the input. The first integer, K, is the number of possible answers to each question (no larger than 10). The second integer, N, is the number of items in the set of possible choices (no larger than 2,147,483,647). A pair of zeroes will follow the last case.

Output
For each input case, display a single line that looks like this:

     N **items,** *K* **answers per question,** *M* **questions**

where N and K are the values from the input, and M is the maximum number of questions required.

Sample Input	Expected Output
2 524288	524288 items, 2 answers per question, 20 questions
3 524288	524288 items, 3 answers per question, 13 questions
4 524288	524288 items, 4 answers per question, 11 questions
3 9	9 items, 3 answers per question, 3 questions
10 1000	1000 items, 10 answers per question, 4 questions
0 0	