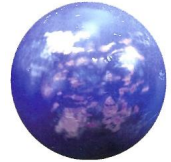


Problem H: Breaking Booma

During the Trade Federation's assault on planet Naboo, the Gungan Grand Army used a type of weapon called a booma. A booma consists of blue plasma energy locked in a thin shell which breaks if thrown hard enough. Booma are very effective when used against electronic foes such as droids because the plasma energy burns out their circuits.

Because the weapon discharges when, and only when, the shell is broken, it is important that the shell be thick enough to avoid breaking prematurely, and thin enough to break on impact with a target. In order to test that the shell is an appropriate thickness, Gungan engineers take a number of booma out of every batch and see what force is needed to discharge them. The way they do this is by dropping the booma off of different stories of a tall building and noting which story the booma breaks from. If the booma breaks when dropped from a given story, it would also break from every story above that. If a booma does not break when dropped from a given story, it would also not break from any story below that. If a booma is dropped and does not break, it may be reused in testing. If it breaks, however, it must be thrown away. The engineers must test the booma to determine which story (if any) is the first one they will break from.



The engineers want to do the testing with the least number of drops possible. If they were allowed to break as many boomas as they wanted, they would use a binary search strategy by dropping a booma from the middle story, and then seeing if the top half or bottom half should be tested next based on whether or not the first drop broke. If, however, they are only allowed to break one booma, then they must try dropping it off every story from the first until it finally breaks.

You must write a program that reports how many drops are needed to test a batch of booma based off how many booma are allowed to be used and the number of stories to be tested. The number of drops needed must be the minimum number needed in the worst case scenario, that is, the number of drops in which you can guarantee that you will find the answer.

Input

The first line of input is a number N giving the number of test cases. Following that are N lines, one for each of the test cases. Each test case line contains 2 integers. The first is the number of boomas available for the testing and the second is the number of floors to test.

Output

Output will consist of one line for each test case. Each line will be of the form “Minimum number of drops with B boomas and F floors is D .” where B and F are the number of boomas and floors for the test case and D is the minimum number of drops in the worst case needed for the test case.

Sample Input

```
2
1 100
2 100
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Sample Output

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Minimum number of drops with 1 boomas and 10 floors is 100.
Minimum number of drops with 2 boomas and 10 floors is 14.
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