2439 - Fractal

Description

Fabian is a student of computer science and some of his classes cause him sleepiness. Given the difficulty of this situation, fabian has been in the search of a solution to this problem and with the passage of time he has discovered an activity which help him to stay awake in those boring classes, this activity consists of drawing some kind of figure over a piece of paper.

In this precise moment fabian is taking one of the classes that makes him sleepy and he has decided to apply this new technique discovered by him. Inspired in a conversation with one of his professors about the Koch's Curve, he has created his own fractal and it's constructed in the following way:

1. The figure starts with a line segment of length L.
2. The line segment then it's divided in three sections of length L/3, after that the central section it's removed and three additional segments with length L/3 are arranged in a way where an square is formed by the three additional segments with the segment that was just removed.
3. the previous step is then repeated a desired number of times for each one of the segments of the new figure.

Iteration 0...

Iteration 1...

Iteration 2...

Iteration 3...

Iteration 4...

And so on...

To make the figure described, fabian has a new generation pen. He bought that pen in the UTP store, the main feature of this pen is that allows the user to know through a small electronic board the available length in centimeters to keep drawing with the pen.

Given the initial line segment length **L** in centimeters of the figure (*Iteration 0*) and the available length **S** in centimeters to keep drawing with the pen, Fabian wants to know beforehand what is the iteration number **N** of the fractal figure, given that the **N+1** iteration is impossible to draw with the amount of ink inside the pen.

Input specification

The input consists of several test cases. The first line contains only an integer number **T (1 <= T <= 500)** indicating the number of test cases. Each of the next **T** lines contains two integer numbers **L** and **S (1 <= L <= 10, 1 <= s <= 1000, L <= S)** separated by one space, representing respectively the initial length of the segment on iteration **0** and the available length to keep writing with the pen.

Output specification

Write only one line for each test case with the integer number **N**, the biggest iteration number that fabian could draw with the given values.

Sample input

```
5
1 1
1 2
2 16
1 765
1 766
```

Sample output

```
0
1
4
12
13
```

Hint(s)

Source	Internal Programming Contest IV. UTP, Colombia. Diego Alejandro Agudelo España
Added by	**ymondelo20**
Addition date	2013-05-19
Time limit (ms)	1000

Test limit (ms)	1000
Memory limit (kb)	130000
Output limit (mb)	64
Size limit (bytes)	15000
Enabled languages	Bash C C# C++ Java Pascal Perl PHP Python Ruby Text