

There is a very interesting phenomenon that can be observed when a population of predators and their prey are put in a closed system. When the predators dominate the prey, the predators themselves start going extinct, because they destroy their own food source.

For simplicity, let's look at one similar system, with the following properties:

- Initially there are **X** predators and **each** one of them needs to eat **K** prey **per day**
- On the same day after eating, the predators multiply and **X/2** new predators appear. If **X/2** is not whole, round it down.
- Initially there are **Y** prey. They cannot multiply in any way.

Given **X**, **Y** and **K** find out how many days can the population of predators continue to eat and multiply, before there isn't enough prey for every predator to eat fully.

Input

From the first and only line of the input file `symbiosis.in` read the numbers **X**, **Y** and **K**.

Output

On the output file `symbiosis.out` print the wanted answer.

Constraints

$$2 \leq X, Y, K \leq 1\,000\,000\,000\,000\,000\,000$$

Time limit: 0.2 seconds

Memory limit: 256 MB

Example

Input (<code>symbiosis.in</code>)	Output (<code>symbiosis.out</code>)
2 10 1	3
15 30 4	0
2 1000000000000000 7	66
4 1230 3	9

Explanation for the first test: Initially there are 2 predators. After the first day they become 3 and the prey 8. After the second day, the predators are 4 and the prey - 5. After the third and last day - 6 predators and 1 prey.