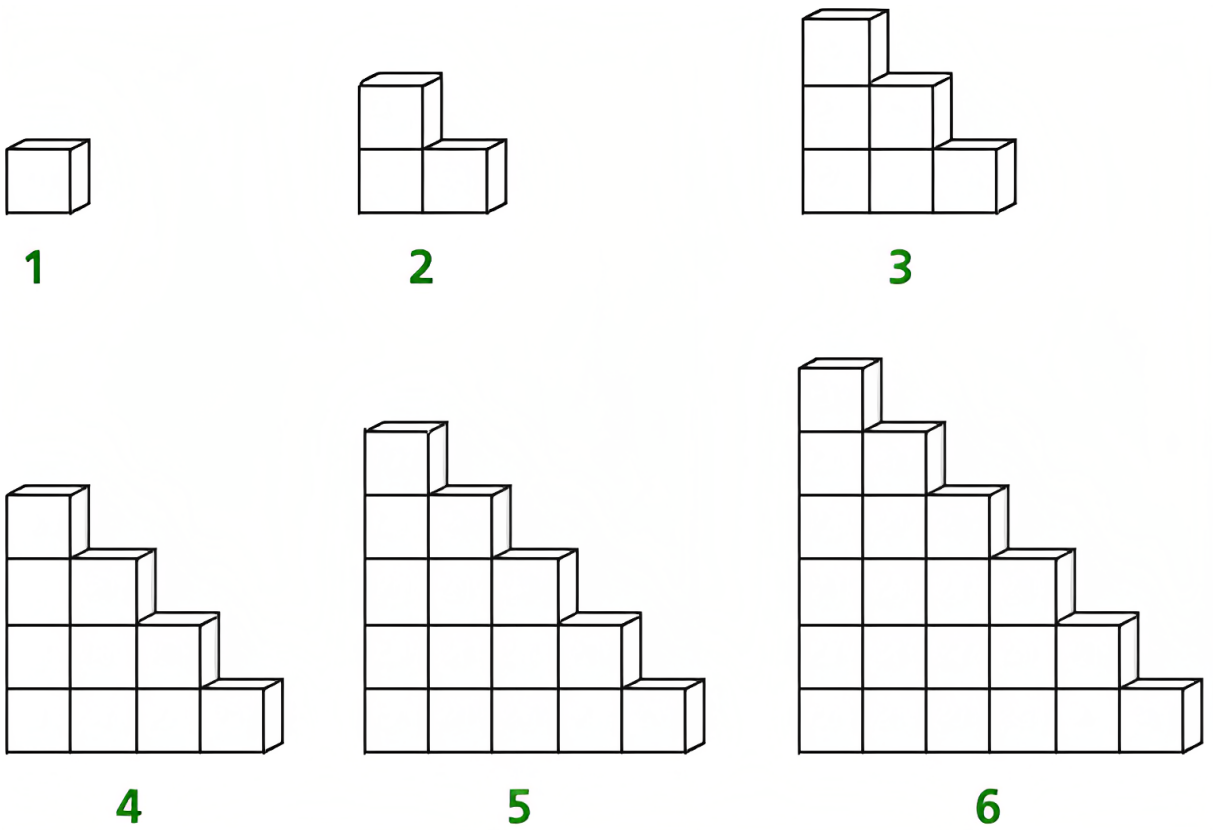
Ayman and Stairs (Hard Version)

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	256 megabytes

The only difference between the two versions of the problem is the constraints on n. In this version $n \leq 10^{18}$.

Ayman likes stairs very much, and does not get tired of making them. His dad brought him n cubes and Ayman wonders what is the maximum length of stairs he can make with them. Can you help him to find that answer?

A sequence of stairs of length k is a succession of k columns made of cubes, where the 1-st column has 1 cube, the 2-nd column has 2... and so forth until the k-th column.



Here is an example of sequences of stairs of lengths from 1 to 6

Note that he does not have to use all the n cubes.

Input

A positive integer n ($1 \leq n \leq 10^{18}$) representing the number of cubes.

Output

Output one integer, the maximum length of stairs Ayman can make.

Examples

standard input	standard output
10	4
8	3
500000000500000000	1000000000