Is a triangle

Time Limit 1 second

JP has N coins in his pocket. While he waits for the contest to start he puts 1 coin in the table, then he puts 2 coins below the one he put before and makes a triangle. Then he does the following:

- Let *K* be the last amount of coins JP put and K' =K+1 JP Adds K' coins in such way the coins are still arranged in a triangle.
- Repeat the previous step until JP can not add more coins

If at the end of the procedure JP has no coins then it is said that N is a triangular number as all the coins can be arranged in this way to create a triangle.

Your task is to find given the number *N* if it is a triangular number, in such case you need to find the last value of *K0* JP used to create the triangle.

Input

The first line of input contains a number T the number of test cases. Each of the next T lines contain a single number N.

- $1 \leq T \leq 100$
- $3 \leq N \leq 10^{18}$

Output

For each test case you must print the value of the last K' used by JP to create the triangle given that N is triangular, print -1 otherwise.

Example

Input	Output
3 55 90 10	10 -1 4