

## 8206 Heron and His Triangle

A triangle is a Heron's triangle if it satisfies that the side lengths of it are consecutive integers  $t - 1$ ,  $t$ ,  $t + 1$  and that its area is an integer. Now, for given  $n$  you need to find a Heron's triangle associated with the smallest  $t$  bigger than or equal to  $n$ .

### Input

The input contains multiple test cases. The first line of a multiple input is an integer  $T$  ( $1 \leq T \leq 30000$ ) followed by  $T$  lines. Each line contains an integer  $N$  ( $1 \leq N \leq 10^{30}$ ).

### Output

For each test case, output the smallest  $t$  in a line. If the Heron's triangle required does not exist, output '-1'.

### Sample Input

```
4
1
2
3
4
```

### Sample Output

```
4
4
4
4
```