The ? 1 ? 2 ? ... ? n = k problem

The problem

Given the following formula, one can set operators '+' or '-' instead of each '?', in order to obtain a given k
? 1 ? 2 ? ... ? n = k

For example: to obtain **k = 12** , the expression to be used will be:
- 1 + 2 + 3 + 4 + 5 + 6 - 7 = 12
with **n = 7**

The Input

The first line is the number of test cases, followed by a blank line.

Each test case of the input contains integer k (0<=|k|<=1000000000).

Each test case will be separated by a single line.

The Output

For each test case, your program should print the minimal possible n (1<=n) to obtain k with the above formula.

Print a blank line between the outputs for two consecutive test cases.

Sample Input

```
2

12

-3646397
```

Sample Output

```
7

2701
```

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