

On February 19, 2017, Red Matemática proposed the following mathematical challenge on its twitter account (@redmatematica): “Felipe, how many terms of the next sequence of numbers must be added to make the result equal to 200?”

$$\frac{1}{\sqrt{1} + \sqrt{2}} + \frac{1}{\sqrt{2} + \sqrt{3}} + \frac{1}{\sqrt{3} + \sqrt{4}} + \frac{1}{\sqrt{4} + \sqrt{5}} + \dots = 200$$

Using this interesting puzzle as our starting point, the problem you are asked to solve now is: Given a positive integer  $S$  ( $1 \leq S \leq 10^9$ ) representing the result obtained for the sum of the terms in the sequence, find out the number  $n$  that represents the total number of terms in the sequence to sum up.

$$\frac{1}{\sqrt{1} + \sqrt{2}} + \frac{1}{\sqrt{2} + \sqrt{3}} + \frac{1}{\sqrt{3} + \sqrt{4}} + \frac{1}{\sqrt{4} + \sqrt{5}} + \dots + \frac{1}{\sqrt{n} + \sqrt{n+1}} = S$$

## Input

Input begins with an integer  $t$  ( $1 \leq t \leq 5 \cdot 10^5$ ), the number of test cases, followed by  $t$  lines, each containing an integer  $S$  ( $1 \leq S \leq 10^9$ ).

## Output

For each test case, your program must print one positive integer denoting the number  $n$  that represents the total number of terms in the sequence to sum up.

## Sample Input

```
1
200
```

## Sample Output

```
40400
```