13187   Felipe and the Sequence

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

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

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.

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

Input

Input begins with an integer t ($1 \leq t \leq 5*10^5$), 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
```