

# Training Land of Fury

S.H.I.E.L.D. is recruiting soldiers for the battle with Loki's army. Nick Fury has come to Manhattan to find a large area of land to be used for training purposes. He meets a popular landlord there who is a little foolish by nature.

He gives square pieces of land with integral sides and charges on the basis of number of pieces of land bought irrespective of how large a piece of land is. Fury has to buy exactly **A** square units of land. Help Fury by determining the minimum number of pieces that should be bought in order to minimize the expenditure.

## Input

The first line of the input contains an integer **T** denoting the number of test cases. The first line of each test case contains a single integer **A** denoting the area that nick fury want to buy.

- $10 \leq T \leq 100000$
- $1 \leq A \leq 1000$

## Output

For each test case print the minimum number of pieces that should be bought.

## Example

Input:

```
4
1
2
3
10
```

Output:

```
1
2
3
2
```

## Explanation

For the last test case 10 the answer will be 2. 10 can be expressed as sum of minimum two squares that is  $10 = 3^2 + 1^2$ .