CodeForces Problem

March 27, 2023

B. Points on Plane

Constriants

Time Limit 2 seconds **Memory Limit** 256 MB

Problem Statement

You are given a two-dimensional plane, and you need to place n chips on it.

You can place a chip only at a point with integer coordinates. The cost of placing a chip at the point (x, y) is equal to $|x| + |y|$ (where $|a|$ is the absolute value of a).

The cost of placing n chips is equal to the maximum among the costs of each chip.

You need to place n chips on the plane in such a way that the Euclidean distance between each pair of chips is strictly greater than 1, and the cost is the minimum possible.

Input Description

The first line contains one integer t ($1 \le t \le 10^4$) — the number of test cases. Next t cases follow.

The first and only line of each test case contains one integer n ($1 \le n \le 10^{18}$) — the number of chips you need to place.

Output Description :

For each test case, print a single integer — the minimum cost to place n chips if the distance between each pair of chips must be strictly greater than 1.

Examples

Input
4
1
3
5
975461057789971042
Output
0
1
2
987654321

Note

In the first test case, you can place the only chip at point $(0, 0)$ with total cost equal to $0 + 0 = 0$.
In the second test case, you can, for example, place chips at points $(-1, 0)$, $(0, 1)$ and $(1, 0)$ with costs $| - 1| + |0| = 1$, $|0| + |1| = 1$ and $|0| + |1| = 1$. Distance between each pair of chips is greater than 1 (for example, distance between $(-1, 0)$ and $(0, 1)$ is equal to $\sqrt{2}$). The total cost is equal to

$\max(1, 1, 1) = 1$.
In the third test case, you can, for example, place chips at points $(-1, -1)$, $(-1, 1)$, $(1, 1)$, $(0, 0)$ and $(0, 2)$. The total cost is equal to $\max(2, 2, 2, 0, 2) = 2$.