Jetpack Jumps

Recently, Lea found a new game on the app store of her choice - “Jetpack Jumps”. Since then, she spent countless hours jumping from platform to platform with her jetpack.

It works like this: Lea starts on the leftmost of an infinite series of platforms. She now jumps to the right one platform at a time, trying to get as far as possible (and break all the highscores) without falling into the bottomless pit between the platforms.

The distance between the platforms always increases by 1 meter, i.e. the second platform comes 1 meter after the first, the third comes 2 meters after the second, and so on. Lea herself can only jump a single meter, but can extend her jump by using her jetpack. With the jetpack, Lea can jump as far as she wants to. However, every meter that she uses the jetpack uses up fuel - the longer the jump, the more fuel she needs. Thus, for a jump of x meters, she needs $(x-1)^2$ liters of fuel (since she has to accelerate upwards first).

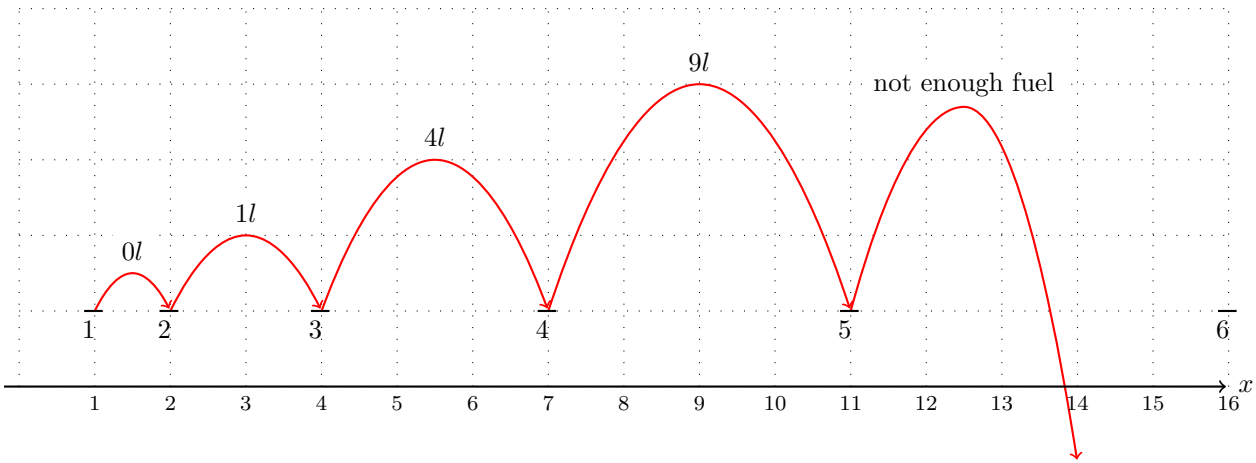

Figure 1: Illustration of the sample input, case 2.

Lea starts with a set amount of fuel. Assuming she plays perfectly, can you tell her which platform she can reach before she eventually runs out of fuel and tumbles down into the darkness (or has to buy the DLC for additional fuel)?

Input

The first line of the input contains an integer t. t test cases follow.

Each test case consists of a single line containing an integer f, the amount of fuel Lea starts with (in liters).

Output

For each test case, print a line containing “Case #i: x” where i is its number, starting at 1 and x is the index of the platform Lea can reach (Lea starts on platform 1). Each line of the output should end with a line break.

Constraints

- $1 \leq t \leq 20$.
- $1 \leq f \leq 10^{24}$

Sample Input 1

```
4
5
15
35
100
```

Sample Output 1

```
Case #1: 4
Case #2: 5
Case #3: 6
Case #4: 8
```

Sample Input 2

```
8
64
6
26
53
14
87
1
5
```

Sample Output 2

```
Case #1: 7
Case #2: 4
Case #3: 5
Case #4: 6
Case #5: 5
Case #6: 7
Case #7: 3
Case #8: 4
```