You are given Q queries. Each query consists of a single number N. You can perform any of the 2 operations on N in each move:

1: If we take 2 integers a and b where $N = a \times b (a \neq 1, b \neq 1)$, then we can change $N = max(a, b)$

2: Decrease the value of N by 1.

Determine the minimum number of moves required to reduce the value of N to 0.

Input Format

The first line contains the integer Q.
The next Q lines each contain an integer, N.

Constraints

$1 \leq Q \leq 10^3$
$0 \leq N \leq 10^6$

Output Format

Output Q lines. Each line containing the minimum number of moves required to reduce the value of N to 0.

Sample Input

```
2
3
4
```

Sample Output

```
3
3
```

Explanation

For test case 1, We only have one option that gives the minimum number of moves.
Follow 3 -> 2 -> 1 -> 0. Hence, 3 moves.

For the case 2, we can either go 4 -> 3 -> 2 -> 1 -> 0 or 4 -> 2 -> 1 -> 0. The 2nd option is more optimal. Hence, 3 moves.