B. A Simple Problem

Time Limit: 1.0 Seconds Memory Limit: 65536K

Given a nonnegative integer a, and a positive integer N, we define:

f(a, 1) = a
f(a, k) = f(a, k －C 1) * f(a, k －C 1) % N, k > 1

There may or may not exist some positive integer k satisfying f(a, k) = 0.

Your task is, given a positive integer N, to determine how many a ($0 \le a \le N$) there are, such that for some positive integer k, f(a, k) = 0.

Input

The input contains an integer T on the first line, indicating the number of test cases. Each test case contains only one positive integer N ($1 \le N \le 1000000000$) on a line.

Output

For each test case, output the answer on a single line.

Sample Input

```
6
2
12
50
180
245
361
```

Sample Output

```
2
3
6
7
8
20
```

Source: The 5th UESTC Programming Contest

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