

Triple-Free Sets

A set S of positive integers is called *strongly triple-free* if, for any integer x , the sets $\{x, 2x\}$ and $\{x, 3x\}$ are not subsets of S . Let's define $F(n)$ as a number of strongly triple-free subsets of $\{1, 2, \dots, n\}$, where n is a natural number.

You need to write a program which being given a number n calculates the number $F(n)$ modulo 1 000 000 001.

Input

The first line of input contains integer T ($1 \leq T \leq 500$) - the number of testcases. Then descriptions of T testcases follow.

The description of the testcase consists of one line. The line contains an integer number n ($1 \leq n \leq 100\,000$).

Output

For each testcase in the input your program should output one line. This line should contain one integer number which is the number $F(n)$ modulo 1 000 000 001.

Example

Input:

```
5
3
1
10
20
39
```

Output:

```
5
2
198
43776
971827200
```