Project Euler #106: Special subset sums: meta-testing

This problem is a programming version of Problem 106 from projecteuler.net

Let $S(A)$ represent the sum of elements in set A of size n. We shall call it a special sum set if for any two non-empty disjoint subsets, B and C, the following properties are true:

- $S(B) \neq S(C)$; that is, sums of subsets cannot be equal.
- If B contains more elements than C then $S(B) > S(C)$.

For this problem we shall assume that a given set contains n strictly increasing elements and it already satisfies the second rule.

Surprisingly, out of the 25 possible subset pairs that can be obtained from a set for which $n = 4$, only 1 of these pairs need to be tested for equality (first rule). Similarly, when $n = 7$, only 70 out of the 966 subset pairs need to be tested.

For a given set size n, how many subset pairs need to be tested for equality?

Input Format

First line contains an integer T denoting the number of test cases.
Each of the following T lines contain one integer n - the size of set.

Constraints
$1 \leq T \leq 30$
$1 \leq n \leq 10^6$

Output Format

For each of T test cases print one line containing a single integer - the number of subset pairs that need to be tested for equality. As this number can be extremely large, output it modulo $10^9 + 7$.

Sample Input

```
3
3
4
7
```

Sample Output

```
0
1
70
```