# 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.

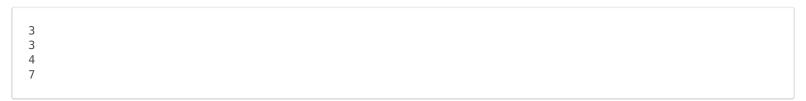
#### **Constraints**

\$1 \le T \le 30\$ \$1 \le n \le 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



## **Sample Output**

0		
1		
70		
7.0		