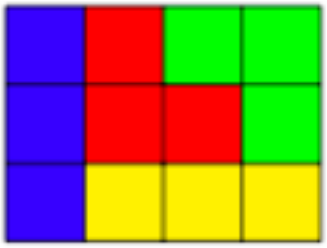
Problem L. Long Grid Covering

Input file:	*standard input*
Output file:	*standard output*
Time limit:	2 seconds
Memory limit:	512 mebibytes

We have a grid of height 3 and width n, as well as pieces that occupy 3 adjacent cells. Given n, determine the number of ways to fill the grid so that each cell is covered by exactly one piece and no piece sticks out of the grid. Here there is an example of a way to fill a grid of width 4:



Notice that any piece will be a rotation of one of the pieces of this example. Find the answers modulo $10^9 + 7$.

Input

The first line contains an integer t, the number of test cases ($1 \le t \le 100$).

Each test case is given on a separate line containing an integer n ($1 \le n \le 10^{18}$), the width of the grid.

Output

For each test case, print a line with a single integer: the number of ways to fill the grid with aforementioned conditions modulo $10^9 + 7$.

Example

standard input	standard output
3 1 2 3	1 3 10