

Four colors

Let there be given n points: $P_1, P_2 \dots P_n$ arranged in this order on a line. We would like to color them using four colors: white, black, red, and blue, in such a way that for every three consecutive points it is true that either:

- 1. the colors of these three points are pairwise distinct, or
- 2. the color of some point is white.

Input

An integer T , denoting the number of testcases ($T < 100000$). In each line you are given one positive integer ($n < 1000000000$). There are 5 input sets.

Output

Find the number of possible colorings of the n points. Since the answer can be very big, output only the answer modulo 1000000007.

Example

Input:

```
4
1
2
3
1000
```

Output:

```
4
16
43
283570349
```

Warning: large input/output data, be careful with certain languages

Warning: A naive algorithm will probably solve only the first input set.