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Overview	Problem -						

Description

P(i-2) + P(i-3).

In "Avengers 3", we know that Thanos wants to eliminate half of the world to keep the world in a good balance. But, have you ever wondered about how he choose "1/2" ? Why don't he choose "1/3", "1/4", or "253/502" ?

of population of this world: On the i-th year from the start of the world, the population of this world P(i) would be: P(i-1) + 2 *

He knows that the population of this world would just keep growing, so he calculated the formula

From this formula, he concluded that P(1)=1, P(2)=12, P(3)=13.

According to this formula, he could estimate the populations of the world on every year, so that he could choose the percentage of the population he would like to eliminate. (We don't know how he choose) Because Thanos has a lot of planets to conquer, he asks you to calculate P(x), while x is given by

him. The world has lived for so many years, so he might ask you P(x) where x would be very large. And

in case of P(x) is super large, the number should mod 10^9+7 .



If you click on this picture, something might happen...

• Given t, indicates the number of testcases.

- P(i) = P(i-1) + 2*P(i-2) + P(i-3)• P(1)=1, P(2)=12, P(3)=13
- Given x, you are going to calculate $P(x)\%(10^9+7)$ of every testcase.

If we rewrite the equation into matrix form, we could get the following formula:

Hint: use fpw(快速冪) to solve this problem!

$$\begin{pmatrix} P(i) \\ P(i-1) \\ P(i-2) \end{pmatrix} = \begin{pmatrix} 1 & 2 & 1 \\ 1 & 0 & 0 \\ 0 & 1 & 0 \end{pmatrix} \begin{pmatrix} P(i-1) \\ P(i-2) \\ P(i-3) \end{pmatrix}, \qquad i>3$$
 With this formula, we can do something more:

$$\begin{pmatrix} P(n) \\ P(n-1) \\ P(n-2) \end{pmatrix} = \begin{pmatrix} 1 & 2 & 1 \\ 1 & 0 & 0 \\ 0 & 1 & 0 \end{pmatrix}^{n-3} \begin{pmatrix} P(3) \\ P(2) \\ P(1) \end{pmatrix}, \qquad n>3$$
 Now, we can implement fpw(快速冪) method on the matrix power part. For those n<=3, just output

Note that you are encouraged to implement a "matrix" struct to solve this easier.

Input

The first line contains one integer t, indicates the number of testcases.

the answer.

There are t lines below, each line contains one integer **x**. $1 \le t \le 20, 1 \le x \le 10^{18}.$

Output

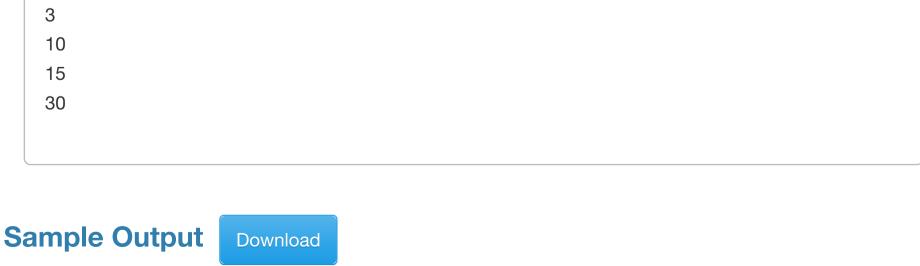
For each testcase, output exactly one integer $P(x)\%(10^9+7)$.

Remember to output a '\n' at the end of every testcase.

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Sample Input Download



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