An easy crypto problem

Description

You are solving crypto problem in CTF contest. This crypto problem is written by fdsas, who always write easy problems.

After further investigation, you find that the answer is to compute the following function under modulo 2^{64}

$$f(x) = 256743000x^2 - 769715000x + 512972514$$

Now, given an integer n, please compute $f(n)$ under modulo 2^{64}.

Input

The first line contains an integer T indicating the total number of test cases.

Each test case contains one line with one integer n.

- $1 \leq T \leq 10^3$
- $1 \leq n \leq 10^9$

Output

For each test case, output one integer indicating the computing result.

Sample Input

```
3
1
2
3
```

Sample Output

```
514
514514
514514514
```