

## Problem B. Count $a \times b$

Time limit: 1s

Color of balloons: light blue

Marry likes to count the number of ways to choose two non-negative integers  $a$  and  $b$  less than  $m$  to make  $a \times b \pmod m \neq 0$ .

Let's denote  $f(m)$  as the number of ways to choose two non-negative integers  $a$  and  $b$  less than  $m$  to make  $a \times b \pmod m \neq 0$ .

She has calculated a lot of  $f(m)$  for different  $m$ , and now she is interested in another function  $g(n) = \sum_{m|n} f(m)$ .

For example,  $g(6) = f(1) + f(2) + f(3) + f(6) = 0 + 1 + 4 + 21 = 26$ . She needs you to double check the answer.

b	0
a	0
0	0

Table 1:  $a \times b \pmod 1$

b	0	1
a	0	1
0	0	0
1	0	1

Table 2:  $a \times b \pmod 2$

b	0	1	2
a	0	1	2
0	0	0	0
1	0	1	2
2	0	2	1

Table 3:  $a \times b \pmod 3$

b	0	1	2	3	4	5
a	0	1	2	3	4	5
0	0	0	0	0	0	0
1	0	1	2	3	4	5
2	0	2	4	0	2	4
3	0	3	0	3	0	3
4	0	4	2	0	4	2
5	0	5	4	3	2	1

Table 4:  $a \times b \pmod 6$

Give you  $n$ . Your task is to find  $g(n)$  modulo  $2^{64}$ .

### Input

The first line contains an integer  $T$  indicating the total number of test cases. Each test case is a line with a positive integer  $n$ .

- $1 \leq T \leq 20000$
- $1 \leq n \leq 10^9$

### Output

For each test case, print one integer  $s$ , representing  $g(n)$  modulo  $2^{64}$ .

### Sample

standard input	standard output
2	26
6	328194
514	