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

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

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.

a \ b	0
0	0

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

a \ b	0	1
0	0	0
1	0	1

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

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

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

a \ b	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: $a \times b \bmod 6$

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 Input

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2
6
514
```

Sample Output

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26
328194
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