1005.Yet Another Easy Function Sum Problem

Input file:	standard input
Output file:	standard output
Time limit:	2 0 seconds
Memory limit:	5 1 2 megabytes

Two years ago, Silver187 learned Mobius inversion and knew how to calculate ($1 \le n \le 10^9$)

$$\sum_{i=1}^{n}\sum_{j=1}^{n}\gcd(i,j)$$

One year ago, Silver187 learned how to calculate ($1 \le n \le 10^5$)

$$\sum_{i=1}^{n}\sum_{j=1}^{n}\varphi(ij)$$

But he tried to solve this problem when $1 \le n \le 10^9$. Finally, he failed to solve it. But he didn't completely fail, he solved a similar problem:

Silver187 defines that if $n = \prod_{i=1}^{k} p_i^{\alpha_i} (p_i \in \text{prime}, \alpha_i > 0, \forall i \ne j, p_i \ne p_j)$, then $H(n) = \prod_{i=1}^{k} p_i$.

Silver187 likes gcd, so he wants to ask you to calculate the result of the following formula.

$$(\sum_{i=1}^{n}\sum_{j=1}^{n} H(ij)[\gcd(i,j) = 1]) \bmod 10^9 + 7$$

Now, Silver187 asks you to solve this problem.

Input

First line has one integer $T(1 \le T \le 5)$, indicating there are T test cases. In each case:

Only one line contains an integer $n(1 \le n \le 10^9)$.

Input guarantee $\sum n \le 2 \times 10^9$.

Output

In each case, output an integer on a line.

Example

standard input	standard output
5 3 5 1000 10000 1000000	23 119 181591410 452132610 74649566