

Magical Pair

Input file: **standard input**
Output file: **standard output**
Time limit: 1 second
Memory limit: 512 megabytes

For a prime number n , if a pair of positive integers (x, y) satisfies the congruence relation:

$$x^y \equiv y^x \pmod{n}.$$

Then we consider (x, y) to be magical.

We want to know how many ordered pairs of positive integers (x, y) are magical for a given prime number n , where $0 < x, y \leq n^2 - n$. Since the answer could be large, we will output it modulo 998244353.

Input

The first line input a positive integer T ($1 \leq T \leq 10$), which represents the total number of test cases.

Then for each test case, input a single line with a prime number n ($2 \leq n \leq 10^{18}$), and it's guaranteed that $n - 1$ is not a multiple of 998244353.

Output

Output T lines, each containing an integer representing the result modulo 998244353.

Examples

standard input	standard output
5	104
5	1550
11	479886
67	1614336
97	1649000
101	
6	284789646
998244353	90061579
998244853	971585925
19260817	887008006
1000000007	527110672
1000000009	334479293
350979772330483783	