Problem E. 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 5 11 67 97 101	104 1550 479886 1614336 1649000
6 998244353 998244853 19260817 1000000007 1000000009 350979772330483783	284789646 90061579 971585925 887008006 527110672 334479293