Problem K. Sum of the Line

Consider a triangle of integers, denoted by T. The value at (r, c) is denoted by $T_{r,c}$, where $1 \leq r$ and $1 \leq c \leq r$. If the greatest common divisor of r and c is exactly 1, $T_{r,c} = c$, or 0 otherwise.

Now, we have another triangle of integers, denoted by S. The value at (r, c) is denoted by $S_{r,c}$, where $1 \leq r$ and $1 \leq c \leq r$. $S_{r,c}$ is defined as the summation $\sum_{i=c}^{r} T_{r,i}$.

Here comes your turn. For given positive integer k, you need to calculate the summation of elements in k-th row of the triangle S.

Input

The first line of input contains an integer t ($1 \leq t \leq 10000$) which is the number of test cases.

Each test case includes a single line with an integer k described as above satisfying $2 \leq k \leq 10^8$.

Output

For each case, calculate the summation of elements in the k-th row of S, and output the remainder when it divided by 998244353.

Example

standard input	standard output
2 2 3	1 5