Ascending Random Number Sequence

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	128 megabytes

Colin recently received a gift from Eva: - a mysterious ascending random number sequence generator! You only need to input a positive integer n, and the generator will return an ascending sequence to you! After repeated experiments, Colin figured out how the generator works.

Initially, the generator will create a new empty sequence and select a number k from $\{1, 2, \cdots, n\}$ with equal probability.

Then, the generator will select a number x from $\{1, 2, \cdots, n\}$ with equal probability as the first element of the sequence.

Next, the generator will repeat the following process:

- If the maximum element in the sequence is greater than or equal to k, the generator will stop running immediately and return the current sequence that has already been generated.
- Otherwise, if the maximum element in the sequence is y, then the generator will select a number x from $\{y+1, y+2, \cdots, n\}$ with equal probability and append x to the end of the sequence.

Now Colin wants to know, for a given n, what the expected length of the sequence returned by the generator is?

Input

A single integer n ($1 \leq n \leq 10^7$).

Output

A single integer, representing the expected length modulo 998244353.

Example

standard input	standard output
3	55458021

Note

- If $k = 1$, the expected length is 1.
- If $k = 2$, the expected length is $1 \times \frac{2}{3} + 2 \times \frac{1}{3} = \frac{4}{3}$
- If $k = 3$, the expected length is $1 \times \frac{1}{3} + 2 \times (\frac{1}{3} + \frac{1}{3} \times \frac{1}{2}) + 3 \times \frac{1}{3} \times \frac{1}{2} = \frac{11}{6}$

Thus, the answer is $(1 + \frac{4}{3} + \frac{11}{6})/3 = \frac{25}{18}$.

The inverse of 18 modulo 998244353 is 720954255, so the output result is $25 \times 720954255 \bmod 998244353 = 55458021$.