Problem D. Rock-Paper-Scissors

Input file:	*standard input*
Output file:	*standard output*
Time limit:	2 seconds
Memory limit:	512 mebibytes

Alice and Bob are going to play the famous game "Rock-Paper-Scissors". Both of them don't like to think a lot, so both of them will use the random strategy: choose rock, paper or scissors with equal probability.

They want to play this game n times, then they will calculate the score s in the following way: if Alice won a times, Bob won b times, and the remaining $n - a - b$ games were draws, the score will be the greatest common divisor of a and b. If a or b is 0, we define the greatest common divisor of a and b as $a + b$.

Calculate the expected value of $s \cdot 3^{2n}$. Note that the answer is necessarily an integer. Because this integer may be very large, find its remainder modulo p instead.

Input

The input contains two integers n and p ($1 \le n \le 10^5$, $10^8 \le p \le 10^9$, p is prime).

Output

Print a single line with a single integer: the answer to the problem modulo p.

Examples

standard input	standard output
1 998244353	6
2 998244353	90