C. Math Festival

time limit per test: 3 s.
memory limit per test: 256 MB

During the annual Math Festival, the organizers set up a spectacular display: a row of n magical lights! These lights are initially all turned off. The festival's highlight is a fascinating game based on these lights:

At each moment, one of the currently off lights is chosen uniformly at random and switched on. After each lighting, the festival checks: if any group of k consecutive lights has more than one light turned on, the game immediately ends.

The goal of the game is to light up as many lights as possible without violating the rule — but randomness controls the process!

The Math Festival committee wants you to calculate the expected number of lights that will be turned on by the time the game finishes.

Input

Each test contains multiple test cases. The first line contains the number of test cases t ($1 \le t \le 10$). Description of the test cases follows.

The only line for each test case contains two integers n and k ($2 \le k \le n \le 10^5$), which are the total number of lights and the length of subsegment of lights that are being checked, respectively.

Output

For each test case print the answer, modulo $10^9 + 7$.

Formally, let $M = 10^9 + 7$. It can be shown that the answer can be expressed as an irreducible fraction $\frac{p}{q}$, where p and q are integers and $q \not\equiv 0 \pmod{M}$. Output the integer equal to $p \cdot q^{-1} \bmod M$. In other words, output such an integer x that $0 \le x < M$ and $x \cdot q \equiv p \pmod{M}$.

Example

input	Copy
1 3 2	

output	Copy
333333338	

Note

Explanation of the first sample test case:

The expected value will be equal to $\frac{2}{6} + \frac{3}{6} + \frac{2}{6} + \frac{2}{6} + \frac{2}{6} + \frac{3}{6} = \frac{14}{6} = \frac{7}{3}$.

Then the required output will be 333333338, since $333333338 \cdot 3 \equiv 7 \pmod{10^9 + 7}$.

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