Another Expected Value Problem

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	256 megabytes

You are given an array a of n integers. You then perform the following process k times.

- Choose an integer i where $1 \le i \le n$, uniformly at random.
- For each $1 \le j \le n$, move a_j one unit closer to a_i. Formally, for each j,
  - If $a_j < a_i$, increment a_j by 1
  - If $a_j > a_i$, decrement a_j by 1
  - If $a_j = a_i$, do not modify the value of a_j.

After performing this process k times, you select an integer i where $1 \le i \le n$ uniformly at random. What is the expected value of a_i?

It can be shown that this value can be represented as $\frac{P}{Q}$ where P and Q are coprime integers and $Q \not\equiv 0 \mod 10^9+7$. Print the value of $P \cdot Q^{-1}$ modulo 10^9+7.

Input

The first line of the input contains a single integer t ($1 \le t \le 10^4$) — the number of test cases.

The first line of each test case contains two integers n and k ($1 \le n, k \le 2 \cdot 10^5$) — the length of the array and the number of operations you will perform.

The second line of each test case will contain n integers $a_1, a_2, \cdots a_n$ ($1 \le a_i \le 10^9$) — the initial array a.

It is guaranteed that the sum of n over all test cases, and the sum of k over all test cases, do not exceed $2 \cdot 10^5$.

Output

For each test case, output a single line containing the expected value of a_i at the end of this process, modulo 10^9+7 as described above.

Example

standard input	standard output
3 3 5 8 8 8 2 1 10 11 7 7 9 8 7 6 5 4 2	8 500000014 857142869

Note

In the first sample case, since all elements of a are initially equal, none of them will change after any of the $k = 5$ operations. Therefore, the final array will be $[8, 8, 8]$, so the expected value of a random element of the final array is 8.

In the second sample case, there is a 50% chance of choosing $i = 1$ in the operation, and a 50% chance of choosing $i = 2$.

1. If $i = 1$ is chosen, all elements of the array will move closer to $a_1 = 10$, so a will go from $[10, 11]$ to $[10, 10]$. The expected value of a random element of this array is 10.
2. If $i = 2$ is chosen, all elements of the array will move closer to $a_2 = 11$, so a will go from $[10, 11]$ to $[11, 11]$. The expected value of a random element of this array is 11.

So there is a 50% chance of the expected value being 10, and a 50% chance of it being 11. Therefore, the final expected value is $10.5 = \frac{21}{2}$, which is equivalent to 5000000014 modulo $10^9 + 7$.