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E. Expected Value Again

time limit per test: 4 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

You are given integers n, k. Let's consider the alphabet consisting of k different elements.

Let **beauty** $f(s)$ of the string s be the number of indexes $i, 1 \le i < |s|$, for which prefix of s of length i equals to suffix of s of length i. For example, beauty of the string $abacaba$ equals 2, as for $i = 1, 3$ prefix and suffix of length i are equal.

Consider all words of length n in the given alphabet. Find the expected value of $f(s)^2$ of a uniformly chosen at random word. We can show that it can be expressed as $\frac{P}{Q}$, where P and Q are coprime and Q isn't divided by $10^9 + 7$. Output $P \cdot Q^{-1} \bmod 10^9 + 7$.

Input

The first and the only line contains two integers n, k ($1 \le n \le 10^5, 1 \le k \le 10^9$) — the length of a string and the size of alphabet respectively.

Output

Output a single integer — $P \times Q^{-1} \bmod 10^9 + 7$.

Examples

input	Copy
2 3	

output	Copy
333333336	

input	Copy
1 5	

output	Copy
0	

input	Copy
100 1	

output	Copy
9801	

input	Copy
10 10	

output	Copy
412377396	

Note

In the first example, there are 9 words of length 2 in alphabet of size 3 — $aa, ab, ac, ba, bb, bc, ca, cb, cc$. 3 of them have beauty 1 and 6 of them have beauty 0, so the average value is $\frac{1}{3}$.

In the third example, there is only one such word, and it has beauty 99, so the average value is 99^2.

- Tutorial (en) ✖