You are given an encoded string s. To decode the string to a tape, the encoded string is read one character at a time and the following steps are taken:

* If the character read is a letter, that letter is written onto the tape.
* If the character read is a digit d, the entire current tape is repeatedly written d - 1 more times in total.

Given an integer k, return *the* kth *letter (****1-indexed)*** *in the decoded string*.

**Example 1:**

Input: s = "leet2code3", k = 10  
Output: "o"  
Explanation: The decoded string is "leetleetcodeleetleetcodeleetleetcode".  
The 10th letter in the string is "o".

**Example 2:**

Input: s = "ha22", k = 5  
Output: "h"  
Explanation: The decoded string is "hahahaha".  
The 5th letter is "h".

**Example 3:**

Input: s = "a2345678999999999999999", k = 1  
Output: "a"  
Explanation: The decoded string is "a" repeated 8301530446056247680 times.  
The 1st letter is "a".

**Constraints:**

* 2 <= s.length <= 100
* s consists of lowercase English letters and digits 2 through 9.
* s starts with a letter.
* 1 <= k <= 109
* It is guaranteed that k is less than or equal to the length of the decoded string.
* The decoded string is guaranteed to have less than 263 letters.