1945. Sum of Digits of String After Convert

You are given a string `s` consisting of lowercase English letters, and an integer `k`.

First, **convert** `s` into an integer by replacing each letter with its position in the alphabet (i.e., replace `'a'` with `1`, `'b'` with `2`, ..., `'z'` with `26`). Then, **transform** the integer by replacing it with the **sum of its digits**. Repeat the **transform** operation `k` **times** in total.

For example, if `s = "zbax"` and `k = 2`, then the resulting integer would be `8` by the following operations:

- **Convert**: `"zbax" → "(26)(2)(1)(24)" → "262124" → 262124`
- **Transform #1**: `262124 → 2 + 6 + 2 + 1 + 2 + 4 → 17`
- **Transform #2**: `17 → 1 + 7 → 8`

Return *the resulting integer after performing the operations described above*.

Example 1:

```
Input: s = "iiii", k = 1
Output: 36
Explanation: The operations are as follows:
- Convert: "iiii" → "(9)(9)(9)(9)" → "9999" → 9999
- Transform #1: 9999 → 9 + 9 + 9 + 9 → 36
Thus the resulting integer is 36.
```

Example 2:

```
Input: s = "leetcode", k = 2
Output: 6
Explanation: The operations are as follows:
- Convert: "leetcode" → "(12)(5)(5)(20)(3)(15)(4)(5)" → "12552031545" → 12552031545
- Transform #1: 12552031545 → 1 + 2 + 5 + 5 + 2 + 0 + 3 + 1 + 5 + 4 + 5 → 33
- Transform #2: 33 → 3 + 3 → 6
Thus the resulting integer is 6.
```

Example 3:

```
Input: s = "zbax", k = 2
Output: 8
```

Constraints:

- `1 <= s.length <= 100`
- `1 <= k <= 10`
- `s` consists of lowercase English letters.

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```
/*
    Straight forward simulation
    Time complexity: O(n+kn)=O(kn)
    Space commplexity: O(1)
*/
class Solution {
    public:
        int getLucky(string s, int k) {
            std::string number = "";
            for (char &c: s) {
                number+=std::to_string(c-'a'+1);
            }

            while (k--){
                int temp = 0;
                for (char x: number) {
                    temp+=x-'0';
                }
                number=std::to_string(temp);
            }
            return stoi(number);
        }
};
```

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```
/*
    Math
    Time complexity: O(n)
    Space commplexity: O(1)
*/
class Solution {
    public:
        int getLucky(std::string s,int k){
            int ans=0;
            for(char& c: s){
                int x=c-'a'+1;
                ans+=x/10+x%10;
            }

            if(k==1) return ans;
            else if(k==2){
                if(ans<10) return ans;
                else if(ans<100) return ans/10+ans%10;
                else if(ans<1000) return ans%10+ans/100+ans/10%10;
                else return ans%10+ans/1000+ans/100%10+ans%100/10;
            }

            return ans%9==0?9:ans%9;
        }
};
```