Problem of the Week
Problem D
Five Digits

A sequence starts out with one 5, followed by two 6s, then three 7s, four 8s, five 9s, six 5s, seven 6s, eight 7s, nine 8s, ten 9s, eleven 5s, twelve 6s, and so on. (You should notice that only the five digits from 5 to 9 are used.)

The first 29 terms of the sequence appear below.

5, 6, 6, 7, 7, 7, 8, 8, 8, 8, 9, 9, 9, 9, 5, 5, 5, 5, 5, 5, 6, 6, 6, 6, 6, 6, 6, 7, . . .

Determine the 2022\textsuperscript{nd} digit in the sequence.

NOTE:
In solving the above problem, it may be helpful to use the fact that the sum of the first \( n \) positive integers is equal to \( \frac{n(n + 1)}{2} \). That is,

\[
1 + 2 + 3 + \cdots + n = \frac{n(n + 1)}{2}
\]

For example, \( 1 + 2 + 3 + 4 + 5 = 15 \), and \( \frac{5(6)}{2} = 15 \).

Also, \( 1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 = 36 \), and \( \frac{8(9)}{2} = 36 \).