Problem of the Week

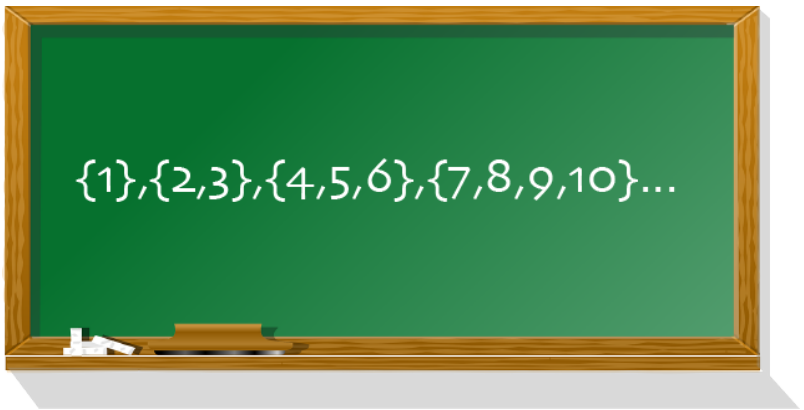
Problem D

Counting Consecutively

Consider the sets of integers $\{1\}$, $\{2, 3\}$, $\{4, 5, 6\}$, $\{7, 8, 9, 10\}$, ...

These sets contain consecutive integers. The first set contains the integer 1, and each set thereafter contains one more integer than the previous set, with its smallest integer being one greater than the largest integer in the previous set.

Determine the sum of the integers in the 101^{st} set.



NOTE:
In solving this 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 $\frac{8(9)}{2} = 36$.