Source task and conventions

Use differencing for $4, 5, 7, 10, 14, 19, 25, \ldots$.

Conventional solution and proof

With $a_0 = 4$, the first differences are $a_n - a_{n-1} = n$ for $n \geq 1$. Thus

$$(1 - z)A(z) = 4 + \sum_{n \geq 1} n z^n = 4 + \frac{z}{(1 - z)^2},$$