2.6. Compute $y[n] = x[n] * h[n]$ where $x[n] = \left(\frac{1}{3}\right)^{-n} u[-n-1]$, $h[n] = u[n-1]$

$x[n] = 3^n u[-n-1] = 3^n u[-(n+1)]$ &

$y[n] = x[n] * h[n] = 3^n u[-(n+1)] * u[n-1] = \sum_k \left(3^k u[-k-1] \cdot u[n-1-k]\right) =$

$= \sum_k \left(\begin{cases} 3^k & \text{if } -k-1 \geq 0, \; n-1-k \geq 0 \\ 0 & \text{otherwise} \end{cases} \right) = \sum_k \left(\begin{cases} 3^k & \text{if } k \leq -1 \text{ and } k \leq n-1 \\ 0 & \text{otherwise} \end{cases} \right) =$

$= \sum_{k=-\infty}^{\min(-1, n-1)} 3^k$

$= \begin{cases} \sum_{k \leq -1} 3^k & \text{if } n \geq 0 \\ \sum_{k \leq n-1} 3^k & \text{otherwise} \end{cases}$

$\sum_{k \leq -1} 3^k = \sum_{k \geq 1} \frac{1}{3^k} \leftarrow$ convergent, ≈ 0.5