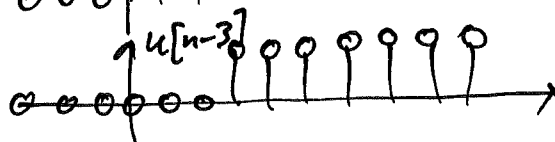
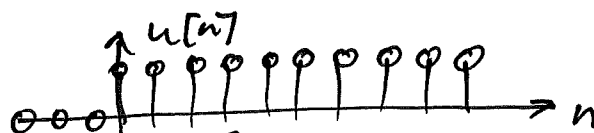
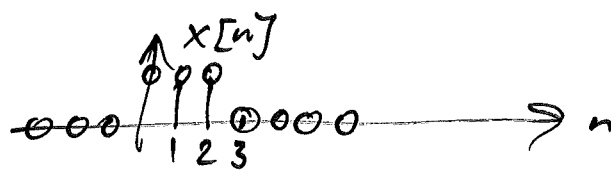


Ex Tidsdiskret faltung.

$$x[n] = u[n] - u[n-3] = \delta[n] + \delta[n+1] + \delta[n-2]$$



$$h[n] = 2^{-n} \cdot u[n]$$

Stem plot of $h[n]$ showing a decaying exponential sequence starting at $n=0$. The horizontal axis is labeled n .

$$y[n] = (x * h)[n] = \sum_{k=-\infty}^{\infty} x[k] h[n-k] = \sum_{k=0}^2 h[n-k]$$

$$= h[n] + h[n-1] + h[n-2]$$

$$= \begin{cases} 0, & n < 0 \\ h[0], & n = 0 \\ h[1] + h[0], & n = 1 \\ h[n] + h[n-1] + h[n-2], & n \geq 2 \end{cases}$$

$$= \begin{cases} 0, & n < 0 \\ 1, & n = 0 \\ 3/2, & n = 1 \\ 2^{-n} + 2^{-(n-1)} + 2^{-(n-2)}, & n \geq 2 \end{cases}$$

$$= \begin{cases} 0, & n < 0 \\ 1, & n = 0 \\ 3/2, & n = 1 \\ 2^{-n}(1+2+4) = 7 \cdot 2^{-n}, & n \geq 2 \end{cases}$$

$1, \frac{3}{2}, \frac{7}{4}, \frac{7}{8}, \frac{7}{16}, \dots$

