Sistemas y Señales I

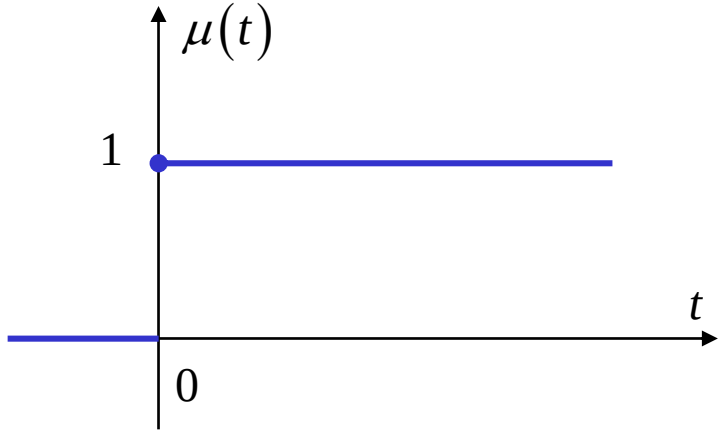
Señales elementales

Temario: Cap. 1: Item 1.3.1

Señales elementales

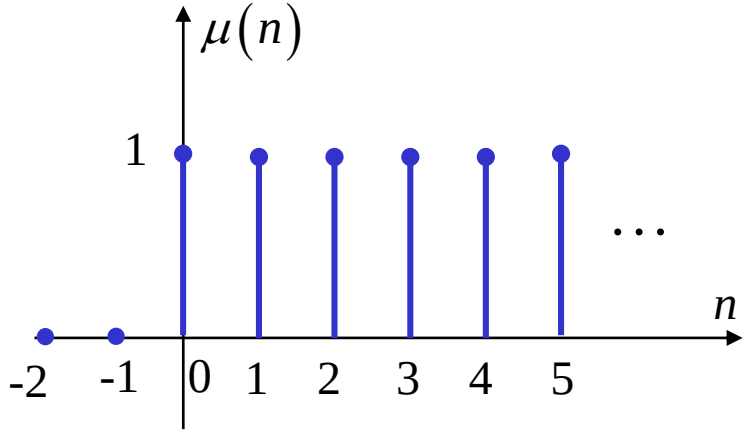
1. Escalón Unitario en Tiempo Continuo

$$\mu(t) = \begin{cases} 1 & t \geq 0 \\ 0 & t < 0 \end{cases}$$



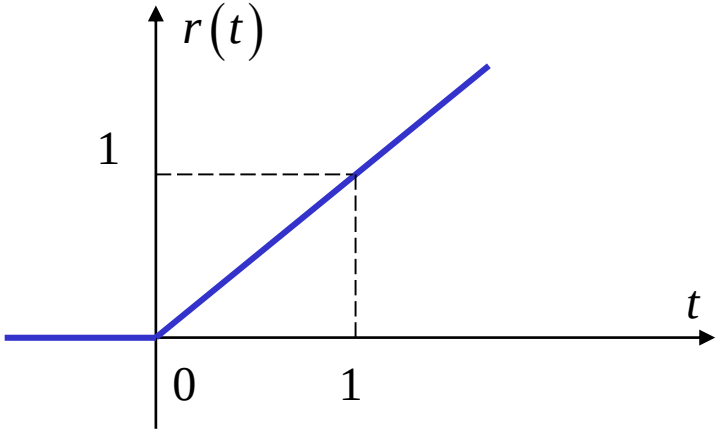
2. Escalón Unitario en Tiempo Discreto

$$\mu(n) = \begin{cases} 1 & n \geq 0 \\ 0 & n < 0 \end{cases}$$



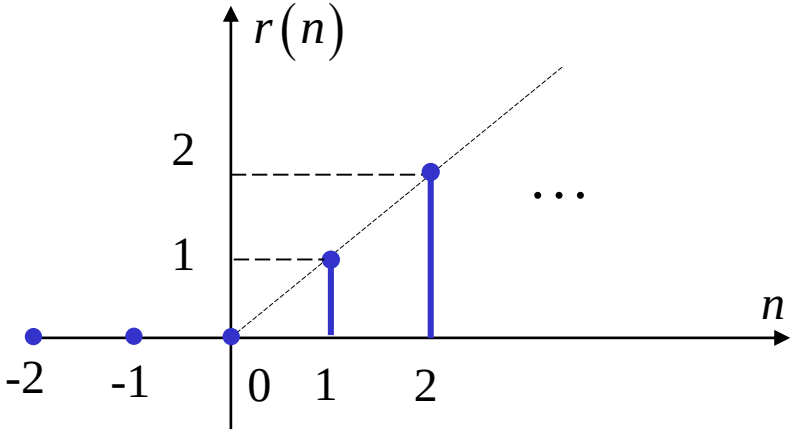
3. Rampa Unitaria en Tiempo Continuo

$$r(t)=\begin{cases} t & t\geq 0 \\ 0 & t<0 \end{cases}$$



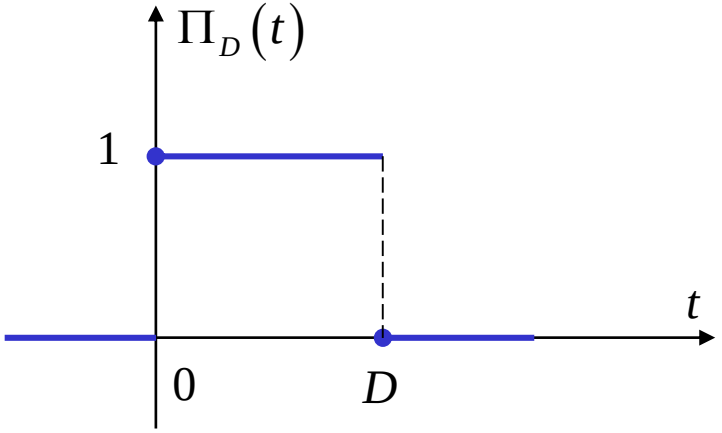
4. Rampa Unitaria en Tiempo Discreto

$$r(n)=\begin{cases} n & n\geq 0 \\ 0 & n<0 \end{cases}$$



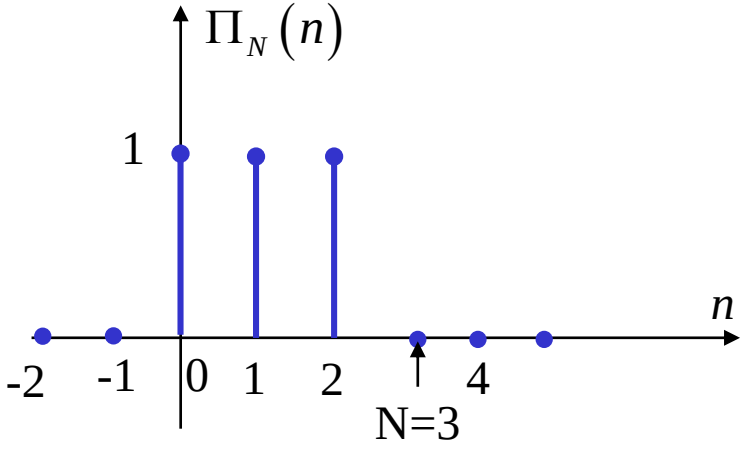
5. Pulso Rectangular en TC (amplitud unitaria y duración D)

$$\Pi_D(t) = \begin{cases} 1 & 0 \le t < D \\ 0 & \text{c.o.c.} \end{cases}$$



6. Pulso Rectangular en TD (amplitud unitaria y duración N)

$$\Pi_N(n) = \begin{cases} 1 & 0 \le n < N \\ 0 & \text{c.o.c.} \end{cases}$$

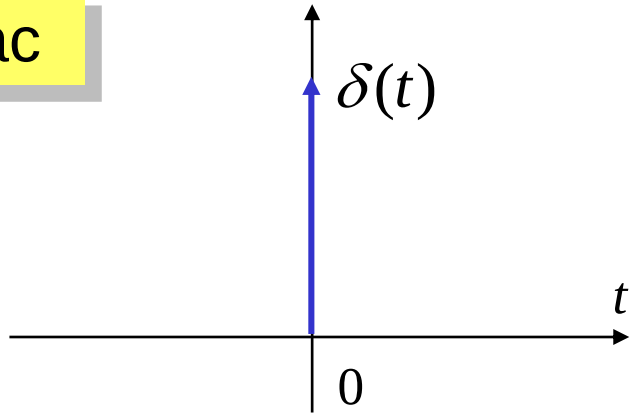


7. Impulso Unitario en Tiempo Continuo

$$\int_{0^-}^{0^+} \delta(t)\, dt = 1$$

Delta de Dirac

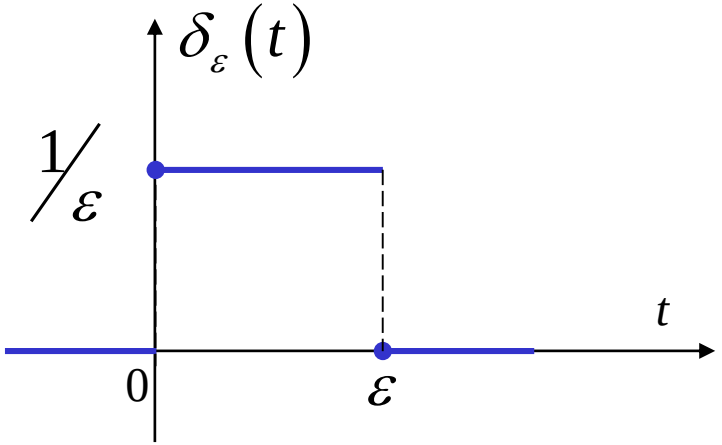
área = 1



$$\int_{0^-}^{0^+} f(t)\delta(t)\, dt = f(0)$$

Si definimos

$$\delta_\varepsilon(t) = \begin{cases} 1/\varepsilon & 0 \le t < \varepsilon \\ 0 & \text{c.o.c.} \end{cases}$$



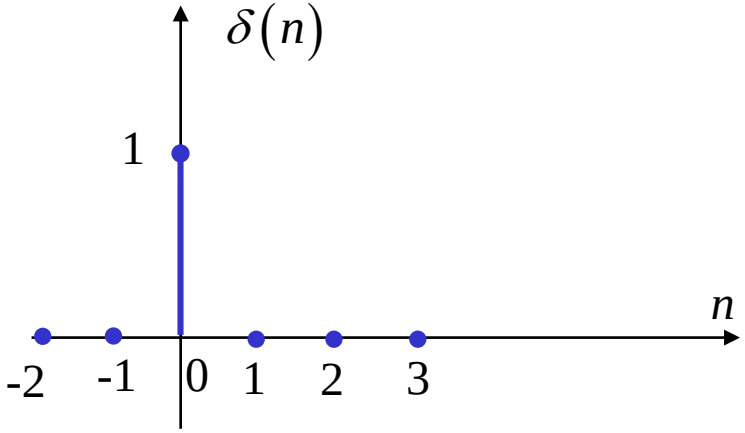
entonces

$$\delta(t) = \lim_{\varepsilon \to 0} \delta_{\varepsilon}(t)$$

8. Impulso Unitario en Tiempo Discreto

$$\delta(n) = \begin{cases} 1 & n = 0 \\ 0 & \text{c.o.c.} \end{cases}$$

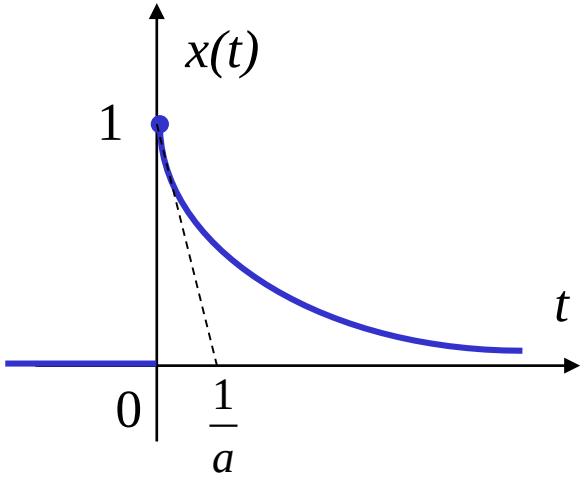
Delta de Kronecker



9. Pulso Exponencial en TC

$$x(t) = e^{-at}\mu(t)$$

$$a > 0$$



10. Pulso Exponencial en TD

$$x(n) = a^{n}\mu(n)$$

$$0 < a < 1$$