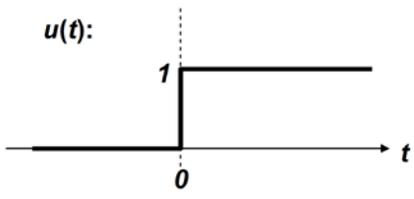
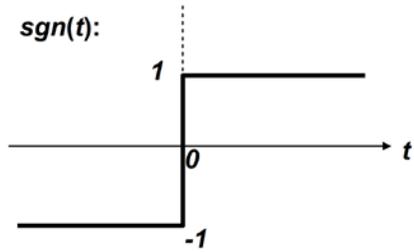
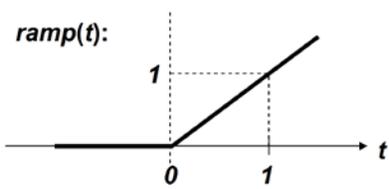
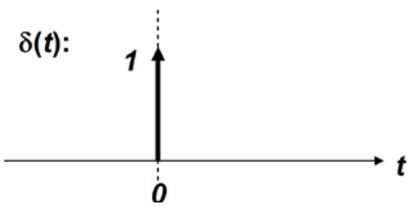


Some Basic Continuous-time (CT) Functions

Function	Mathematical Definition	Practical Definition	Sketch
Unit Step	$u(t) = \begin{cases} 1, & t > 0 \\ \frac{1}{2}, & t = 0 \\ 0, & t < 0 \end{cases}$	$u(t) = \begin{cases} 1, & t \geq 0 \\ 0, & t < 0 \end{cases}$	<p><i>u(t):</i></p> 
Signum	$\text{sgn}(t) = \begin{cases} 1, & t > 0 \\ 0, & t = 0 \\ -1, & t < 0 \end{cases}$	$\text{sgn}(t) = \begin{cases} 1, & t \geq 0 \\ -1, & t < 0 \end{cases}$	<p><i>sgn(t):</i></p> 
Unit Ramp	$\text{ramp}(t) = \begin{cases} t, & t > 0 \\ 0, & t \leq 0 \end{cases}$		<p><i>ramp(t):</i></p> 
Unit Impulse	$\delta(t) = 0, \quad t \neq 0$ $\int_{t_1}^{t_2} \delta(t) dt = \begin{cases} 1, & t_1 < 0 < t_2 \\ 0, & \text{otherwise} \end{cases}$		<p><i>δ(t):</i></p> 

**Periodic
Impulse,
or Impulse
Train**

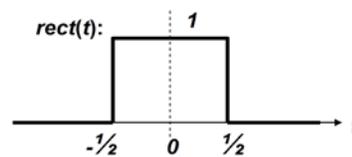
$$\delta_T(t) = \sum_{n=-\infty}^{n=\infty} \delta(t - nT)$$

n is an integer



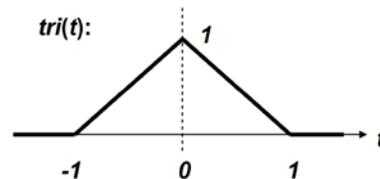
**Unit
Rectangle**

$$rect(t) = \begin{cases} 1, & |t| < \frac{1}{2} \\ \frac{1}{2}, & |t| = \frac{1}{2} \\ 0, & |t| > \frac{1}{2} \end{cases} \quad rect(t) = \begin{cases} 1, & |t| \leq \frac{1}{2} \\ 0, & |t| > \frac{1}{2} \end{cases}$$



**Unit
Triangle**

$$tri(t) = \begin{cases} 1 - |t|, & |t| < 1 \\ 0, & |t| \geq 1 \end{cases}$$



Unit Sinc

$$sinc(t) = \frac{\sin(\pi t)}{\pi t}$$

