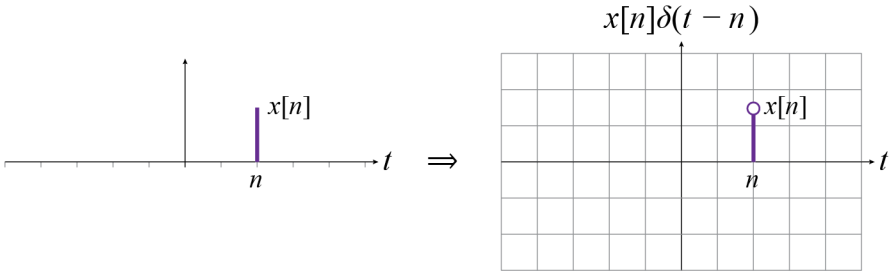
TOOL: Discrete-time convolution may be calculated as a continuous-time convolution by treating each sample $x[n]$ as an impulse $x[n]\delta(t-n)$ that fires at time $t=n$ and has area $x[n]$.

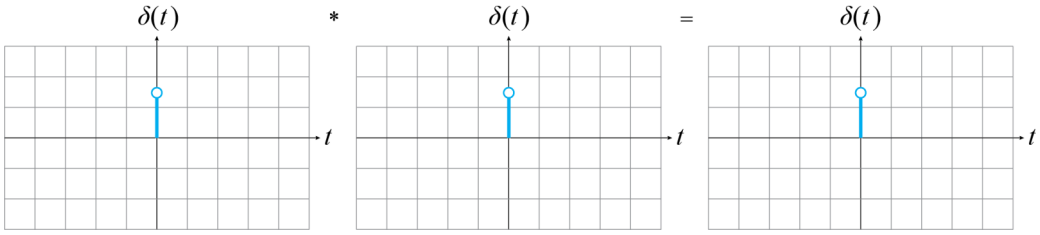
Graphical view:



TOOL: An impulse function convolved with an impulse function is an impulse function.

$$\delta(t)*\delta(t)=\int_{-\infty}^{\infty}\delta(\tau)\delta(t-\tau)d\tau=\delta(t)$$

Graphical view:



TOOL: An impulse function at time $t=a$ convolved with an impulse function at time $t=b$, gives an impulse at time $t=a+b$.

$$\delta(t-a)*\delta(t-b)=\int_{-\infty}^{\infty}\delta(\tau-a)\delta(t-(\tau-b))d\tau=\delta(t-[a+b])$$

Graphical view: