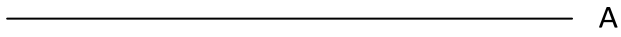
Key Waveforms

DC

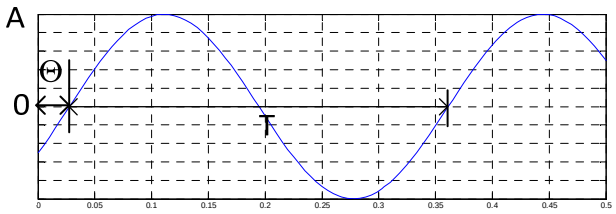


$v(t) = A$

$\frac{d}{dt} A = 0$

$\int_0^t A\, dt = At$

AC

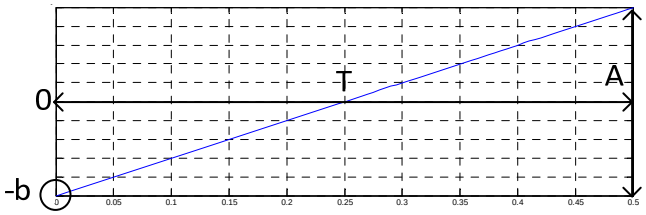


$v(t) = Asin(2\pi ft - \theta) \quad f = \frac{1}{T}$

$\frac{d}{dt} Asin(2\pi ft - \theta) = A \times 2\pi f \times cos(2\pi ft - \theta)$

$\int_0^t Asin(2\pi ft - \theta)dt = \frac{-A}{2\pi f}[\cos(2\pi ft - \theta) - \cos(\theta)]$

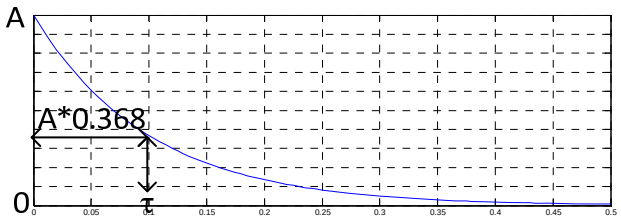
Triangle



$v(t) = mt + b = \frac{A}{T}t + b$

$\frac{d}{dt}\left(\frac{A}{T}t + b\right) = \frac{A}{T}$

$\int_0^t \left(\frac{A}{T}t + b\right) dt = \frac{A}{2T}t^2 + bt$

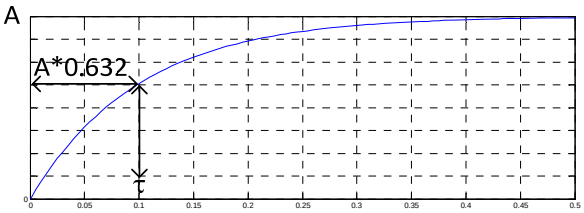


Exponential Spike

$$v(t) = Ae^{\frac{-t}{\tau}}$$

$$\frac{d}{dt}\left(Ae^{\frac{-t}{\tau}}\right) = \frac{-A}{\tau}e^{\frac{-t}{\tau}}$$

$$\int_0^t \left(Ae^{\frac{-t}{\tau}}\right) dt = A\tau\left(1 - e^{\frac{-t}{\tau}}\right)$$



Exponential Rise

$$v(t) = A\left(1 - e^{\frac{-t}{\tau}}\right)$$

$$\frac{d}{dt}\left[A\left(1 - e^{\frac{-t}{\tau}}\right)\right] = \frac{A}{\tau}e^{\frac{-t}{\tau}}$$

$$\int_0^t \left[A\left(1 - e^{\frac{-t}{\tau}}\right)\right] dt = A\left[t - \tau\left(1 - e^{\frac{-t}{\tau}}\right)\right]$$