

Properties of Delta Functions

$$f(t) \delta(t - t_0) = f(t_0) \delta(t - t_0)$$

$$f(t) \delta(t) = f(0) \delta(t)$$

$$f(t) * \delta(t - t_0) = f(t - t_0)$$

$$f(t - t_0) * \delta(t) = f(t - t_0)$$

$$f(t) * \delta(t) = f(t)$$

$$\delta\left(\frac{t - t_0}{b}\right) = |b| \delta(t - t_0)$$

$$\delta(at - t_0) = \frac{1}{|a|} \delta\left(t - \frac{t_0}{a}\right)$$

$$f(t) \frac{1}{|b|} \text{comb}\left(\frac{t - t_0}{b}\right) = \sum_{n=-\infty}^{\infty} \delta(t - t_0 - nb)$$

$$\text{comb}\left(\frac{t - t_0}{b}\right) = |b| \sum_{n=-\infty}^{\infty} \delta(t - t_0 - nb)$$