Lecture 39, Tuesday, April 5, 2022

- Convolution:
  - More properties of convolution:
    - Time shift:

$$y(t) = f(t) * h(t) \quad \Rightarrow \quad f(t - t_0) * h(t) = y(t - t_0) = f(t) * h(t - t_0)$$

      - If one of the convolved functions is time-shifted, but only one, then the output shifts by the same amount $\Rightarrow$ convolution is time-invariant
      - If both of the convolved functions are time-shifted, then the output shifts by the sum of the individual shifts:

$$y(t) = f(t) * h(t) \quad \Rightarrow \quad f(t - t_0) * h(t - t_1) = y(t - t_0 - t_1)$$

    - Distributive:

$$f(t) * [g(t) + h(t)] \; = \; f(t) * g(t) + f(t) * h(t)$$

