

List of things to know, 1/19/04

- Be able to transform from rectangular to polar coordinates complex numbers (and vice versa)
 - Understand Euler's formulas, know how to compute complex roots
 - Be able to compute energy and power quantities for continuous and discrete signals, be able to check whether a signal is an energy or a power signal
 - Be able to time-shift, compress, expand continuous and discrete signals, and plot them
 - Be able to compute the period of a signal (continuous or discrete), be able to check a signal is periodic
 - Be able to compute and plot odd and even parts of signals
 - Be able to plot real and complex exponential signals
 - Be able to plot unit impulse and unit step functions, be able to use them
 - Know what the relationship between unit impulse and step functions is
 - Know what the properties of $\delta(t)$ are and how to use them (sifting and scaling properties)
 - Know how to compute integral expressions containing $\delta(t)$ and $u(t)$
 - Know what the definition for a $\text{sinc}(x)$ and a $\text{Sa}(x)$ function is, what they look like, and where the zero-crossings are.
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- Be able to prove/disprove that a system is memoryless, time-invariant, linear, stable, invertible
 - Be able to relate input and output of a system for LTI (continuous and discrete) systems
 - Know how to compute convolution sum and integral expressions
 - For a given $x[n]$ and $h[n]$, or $x(t)$ and $h(t)$, be able to compute $y[n]$, or $y(t)$
 - Be able to compute convolution expressions using the graphical convolution method
 - Be able to compute the impulse response of a LTI system
 - Be able to check a LTI system is stable using its impulse response