

EE3210 Signals and Systems

Tutorial 10

Problem 1: Consider a continuous-time LTI system with input $x(t) = 1$ and unit impulse response $h(t) = \text{sinc}(t)$. Determine the response of the system $y(t)$.

Problem 2: Consider a continuous-time LTI system with input $x(t) = e^{-t}u(t)$ and unit impulse response $h(t) = e^{-2t}u(t)$. Use frequency-domain analysis to determine the response of the system $y(t)$.

Problem 3: Consider a discrete-time LTI system that is characterized by the difference equation

$$y[n] - \frac{3}{4}y[n-1] + \frac{1}{8}y[n-2] = 2x[n].$$

Use frequency-domain analysis to determine the response of the system $y[n]$ when the input is

$$x[n] = \left(\frac{1}{4}\right)^n u[n].$$