

Problem 20.1: Determine the Fourier transform of each of the discrete-time signals below. Use a straightedge to plot the transform's magnitude and phase on separate plots. Label all axes and all important features. Show the origin for context.

(a) $x_a[n] = (1/2)^n u[n]$

(b) $x_b[n] = (1/4)^n u[n]$

Problem 20.2: Determine the Fourier transform of $g[n] = (1/2)^{|n|}$.

Problem 20.3: A certain signal $w[n]$ has the Fourier transform $W(e^{j\omega}) = \frac{2\pi}{3} \sum_{k=-\infty}^{\infty} \delta(\omega - k\frac{2\pi}{3})$.

(a) With a straightedge, plot $W(e^{j\omega})$ and label both axes and all important features. Show the origin for context.

(b) Determine the signal $w[n]$.

(c) With a straightedge, stem-plot $w[n]$ and label both axes and all important features. Show the origin for context.

Optional, but testable problems: 5.1, 5.2, 5.3, 5.4, 5.21, 5.22