

Problem 17.1: For each periodic signal below, determine and plot its Fourier transform. Use a straightedge and label all axes and important features. Show the origin for context.

(a) $x_a(t) = 2 \cos\left(\frac{3\pi}{4}t + \pi\right)$

(b) $x_b(t) = 1 + \sin(50t) + 2 \cos\left(60t + \frac{\pi}{3}\right)$

Problem 17.2: Determine and plot the Fourier transform of the periodic signal

$$g(t) = \sum_{k=-\infty}^{\infty} \delta(t - 3k).$$

Use a straightedge and label all axes and important features. Show the origin for context.

Problem 17.3: Determine the signal $x(t)$ whose Fourier transform is

$$X(j\omega) = \frac{\pi}{2}[j\delta(\omega + 4) + \delta(\omega + 2) + \delta(\omega - 2) - j\delta(\omega - 4)].$$

Optional, but testable, problems: From the textbook, Problems 4.3, 4.4, 4.21(h).