of 2. What is the minimum length $L = 2^r$ that will meet your resolution requirement?

10.6. The following are three different signals $x_i[n]$ that are the sum of two sinusoids:

$$x_1[n] = \cos(\pi n/4) + \cos(17\pi n/64),$$

$$x_2[n] = \cos(\pi n/4) + 0.8\cos(21\pi n/64),$$

$$x_3[n] = \cos(\pi n/4) + 0.001\cos(21\pi n/64).$$

We wish to estimate the spectrum of each of these signals using a 64-point DFT with a 64-point rectangular window $w[n]$. Indicate which of the signals' 64-point DFTs you would expect to have two distinct spectral peaks after windowing.

10.7. Let $x[n]$ be a 5000-point sequence obtained by sampling a continuous-time signal $x_c(t)$ at $T = 50$ μs. Suppose $X[k]$ is the 8192-point DFT of $x[n]$. What is the equivalent frequency spacing in continuous time of adjacent DFT samples?

10.8. Assume that $x[n]$ is a 1000-point sequence obtained by sampling a continuous-time signal