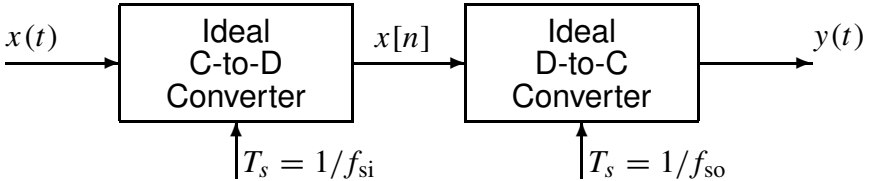
PROBLEM:



(a) Suppose that the input $x(t)$ is given by

$$x(t) = 2 + 3\cos(2\pi(2000)t - \pi/16) + 5\cos(2\pi(7000)t + 3\pi/8)$$

Determine the spectrum for $x[n]$ when $f_{\text{si}} = 8000$ samples/sec. Make a plot for your answer, making sure to label the frequency, amplitude and phase of each spectral component.

(b) Using the discrete-time spectrum from part (a), determine the analog frequency components in the output $y(t)$ when the sampling rate of the D-to-C converter is $f_{\text{so}} = 8000$ Hz.

(c) Again using the discrete-time spectrum from part (b), determine the analog frequency components in the output $y(t)$ when the sampling rate of the D-to-C converter is $f_{\text{so}} = 16000$ Hz. In other words, the sampling rates of the two converters are different.