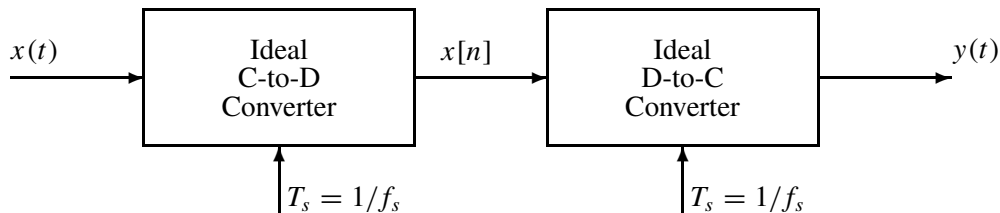


PROBLEM:

Suppose that the output of the D-to-C converter in the above system is found to be

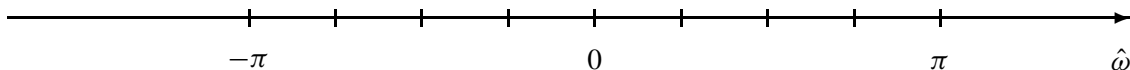
$$y(t) = 5 + 20 \cos(2\pi(100)t + \pi/4)$$

when the sampling rate is $f_s = 1/T_s = 400$ samples/second.

- (a) Give an equation for $x[n]$ in terms of cosine functions. **Write your answer on the line below.**

Answer: $x[n] =$ _____

Plot the spectrum of $x[n]$ for normalized frequencies $-\pi \leq \hat{\omega} \leq \pi$. **Carefully label and dimension your plot.**



- (b) Determine two *different* input signals $x(t) = x_1(t)$ and $x(t) = x_2(t)$ that could have produced the given output of the D-to-C converter. **All of the frequencies in your answers must be positive and less than 400 Hz. Give equations for both inputs on the lines below.**

Answer: $x_1(t) =$ _____

Answer: $x_2(t) =$ _____