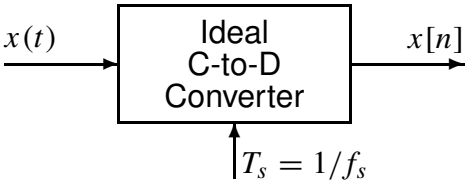
PROBLEM:



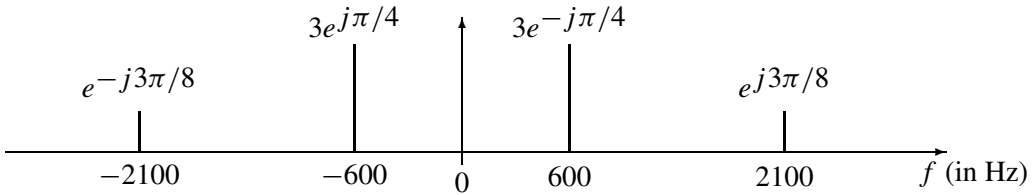
(a) Suppose that the discrete-time signal $x[n]$ is given by the formula

$$x[n] = 3000\cos(0.22\pi n + \pi/4)$$

If the sampling rate is $f_s = 3000$ samples/second, many *different* continuous-time signals $x(t) = x_i(t)$ could have been inputs to the above system. Determine two such inputs with frequency less than 3000 Hz; i.e., find $x_1(t)$ and $x_2(t)$ such that $x[n] = x_1(nT_s) = x_2(nT_s)$ if $T_s = 1/3000$. Give *only* the frequency and phase for each signal.

$x_1(t)$:	$f_1 =$ Hz	$\phi_1 =$ rads
$x_2(t)$:	$f_2 =$ Hz	$\phi_2 =$ rads

(b) If the input $x(t)$ is given by the two-sided spectrum representation shown below,



Determine the spectrum for $x[n]$ when $f_s = 3000$ samples/sec. Make a plot for your answer, but label the frequency, amplitude and phase of each spectral component.