PROBLEM:

$$x(t) \rightarrow \boxed{\begin{array}{c} \text{Ideal} \\ \text{C-to-D} \\ \text{Converter} \end{array}} \rightarrow x[n]$$
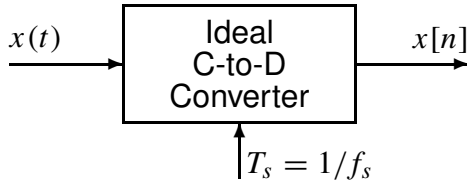
$$T_s = 1/f_s$$

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

$$x[n] = 57\cos(0.20\pi n - \pi/3)$$
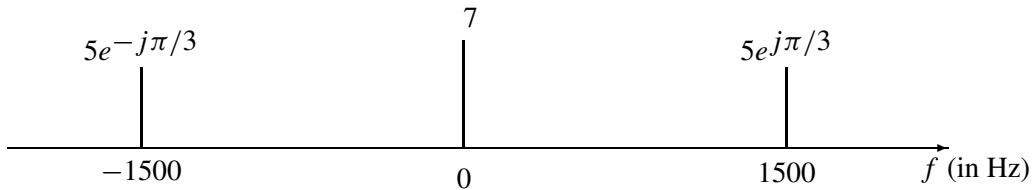
and the continuous-time signal $x(t)$ is given by

$$x(t) = 57\cos(2200\pi t - \pi/3)$$

Determine two different sampling rates (in samples/second), so that $x[n] = x(nT_s)$ is true.

$$\boxed{f_{s1} = \qquad \text{Hz}} \qquad \boxed{f_{s2} = \qquad \text{Hz}}$$

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

Determine the spectrum for $x[n]$ when $f_s = 2000$ samples/sec. Make a $\boxed{\text{plot}}$ for your answer, but label the frequency, amplitude and phase of each spectral component.

$\boxed{\text{Use } \hat{\omega} \text{ for digital freq.}}$