



PROBLEM:

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

$$x[n] = 3 \cos(0.2\pi n - \pi/2)$$

and that it was obtained by sampling a continuous-time signal at a sampling rate of $f_s = 8000$ samples/second.

- Determine two *different* continuous-time signals $x_1(t)$ and $x_2(t)$ whose samples are equal to $x[n]$; i.e., find $x_1(t)$ and $x_2(t)$ such that $x[n] = x_1(nT_s) = x_2(nT_s)$ if $T_s = 1/8000$ sec. Both of these signals should have a frequency less than 8000 Hz. Give a formula for each sinusoidal signal.
- If $x[n]$ is given by the equation above, what signal will be reconstructed by an ideal D-to-C converter operating at a sampling rate of 11,025 samples/second?