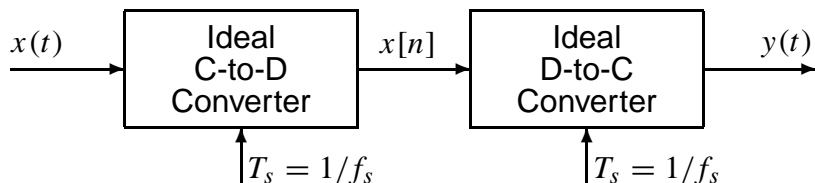


PROBLEM:

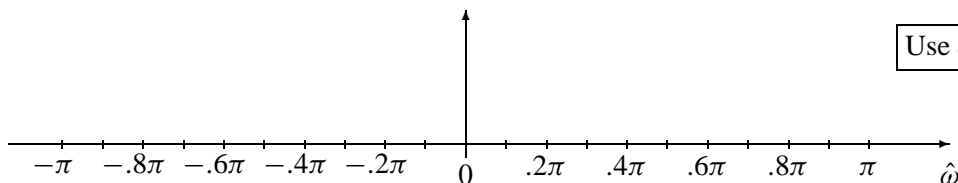


Suppose that the continuous-time input $x(t)$ to the above system is given as

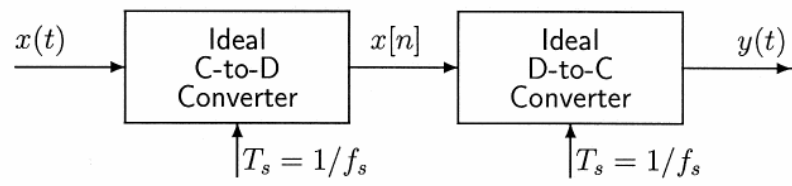
$$x(t) = \cos(16000\pi t) + \cos(4000\pi t) + \cos(1000\pi t).$$

(a) What is required such that no aliasing occurs for $x(t)$?

(b) Given that $f_s = 10,000$ samples/second, the frequency spectrum for $x[n]$.



(c) Given that $x(t) = \cos(26000\pi t)$ and $f_s = 10000$ samples/second, write a simplified expression for the in terms of cosine functions.

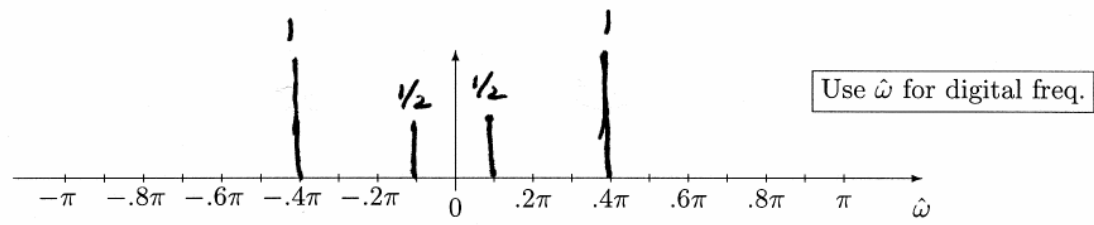


Suppose that the continuous-time input $x(t)$ to the above system is given as

$$x(t) = \cos(16000\pi t) + \cos(4000\pi t) + \cos(1000\pi t).$$

$$f_{max} = 8,000 \text{ Hz.}$$

- (a) What sampling rate is required such that no aliasing occurs for $x(t)$? $f_s = 16,000 \text{ Hz.}$
- (b) Given that $f_s = 10,000$ samples/second, plot the frequency spectrum for $x[n]$.



- (c) Given that $x(t) = \cos(26000\pi t)$ and $f_s = 10000$ samples/second, write a simplified expression for the output $y(t)$ in terms of cosine functions.

$$y(t) = \cos(6000\pi t)$$

NOTE THAT ALIASING OCCURS.