

## PROBLEM:

Define  $x(t)$  as

$$x(t) = \cos(\omega_0 t + \pi/3) + 2 \sin(\omega_0 t - \pi/3)$$

- (a) Find a complex-valued signal  $z(t)$  such that  $x(t) = \Re\{z(t)\}$ . Simplify  $z(t)$  as much as possible, so that you can identify its complex amplitude. Hint: Be careful to note that the second term in  $x(t)$  is a sine rather than a cosine.
- (b) Assume that  $\omega_0 = 20\pi$  rad/sec. Make a plot of  $\Re\{(1 + j)e^{j\omega_0 t}\}$  over the range  $-0.1 \leq t \leq 0.2$  secs. How many periods are included in the plot?