

PROBLEM:

Define $x(t)$ as

$$x(t) = 4 \cos(\omega_0 t + 3\pi/4) + 2 \sin(\omega_0 t)$$

- Find a complex-valued signal $z_1(t)$ such that $\Re\{z_1(t)\} = 4 \cos(\omega_0 t - \pi/4)$.
- Find a complex-valued signal $z_2(t)$ such that $\Re\{z_2(t)\} = 2 \sin(\omega_0 t)$.
- Express $x(t)$ in the form $x(t) = A \cos(\omega_0 t + \phi)$
- Assume that $\omega_0 = 0.4\pi$. Make a plot of $x(t)$ over the range $-5 \leq t \leq 10$. How many periods are included in the plot?
- Find a complex-valued signal $z(t)$ such that $x(t) = \Re\{z(t)\}$.