

PROBLEM:

A periodic signal is represented by the Fourier Series synthesis formula:

$$x(t) = \sum_{k=-\infty}^{\infty} a_k e^{j30\pi kt} \quad \text{where} \quad a_k = \begin{cases} \frac{1}{4 + j2k} & \text{for } k = -3, -2, -1, 0, 1, 2, 3 \\ 0 & \text{for } |k| > 3 \end{cases}$$

- Sketch the two-sided spectrum of this signal. Label all complex amplitudes in **polar form**.
- Determine the fundamental frequency (in Hz) and the fundamental period (in secs.) of this signal.