

ECE 321 - Homework #29

Complex Fourier Transform

For the following waveforms,

a) Find the Fourier transform for the following waveforms as

$$x(t) \approx X_0 + \text{real} \left(\sum_{n=1}^{10} X_n e^{j5nt} \right)$$

b) Plot $x(t)$ vs time along with it's Fourier transform approximation taken out to 10 terms

$$1) \quad x(t) = \begin{cases} 1 & \sin(5t) > 0.5 \\ 0 & \text{otherwise} \end{cases}$$

$$2) \quad x(t) = \begin{cases} \sin(5t) & \sin(5t) > 0 \\ 0 & \text{otherwise} \end{cases}$$

$$3) \quad x(t) = \begin{cases} \sin(5t) & \sin(5t) < 0.8 \\ 0.8 & \text{otherwise} \end{cases}$$