

EE 451: Homework 5

1. #5.25 from textbook
2. #5.27 from textbook
3. #5.52 from textbook
4. #5.84 from textbook
5. Given

$$X(\omega) = \begin{cases} 1, & |\omega| \leq |\omega_c| < \pi \\ 0, & |\omega_c| < |\omega| < \pi \end{cases}$$

- (a) derive an expression for $x(n)$ by taking the inverse discrete time Fourier transform of $X(\omega)$
- (b) write a MATLAB code to plot $X_N(\omega)$ using the Fourier transform of $x(n)$ for $-N < n < N$
- (c) plot $X_N(\omega)$ for $N = \{10, 20, 100\}$