

EE 4440 – Comm Theory – Prelab for Lab 1

The following two questions should be answered before coming to lab. Both will be useful in understanding the lab.

1. Compute the Fourier transform of a rectangular pulse with an amplitude of 2 V and a pulse width of $200\ \mu\text{s}$ centered at $t=0$. Sketch the magnitude of the Fourier transform. At what frequencies do the first two zero crossings occur? What is the relative amplitude difference in dB between the main lobe and the first lobe?
2. Compute the Fourier series of a rectangular pulse train with a peak amplitude of 2 V and a pulse width of $200\ \mu\text{s}$ and a period of 1 ms. Hint: You should be able to use your answer in problem 1 to help solve problem 2. Sketch the amplitude of the first 10 harmonics.