

HW5 Physics 321 Fall 2011

1. For the function  $f(t) = \begin{cases} \sin(\omega_0 t) & |t| < \frac{N\pi}{\omega_0} \\ 0 & |t| > \frac{N\pi}{\omega_0} \end{cases}$

- Plot the function
- Using the sine fourier transformation, find  $F(\omega_0)$
- Plot the result.

2. For the function  $f(x) = \begin{cases} h(1 - a|x|) & |x| < \frac{1}{a} \\ 0 & |x| > \frac{1}{a} \end{cases}$

- Plot the function
- Find the Fourier transformation
- Plot the result

3. Repeat #2 using the discrete fourier transform in Octave. Without padding and then with padding. Provide “.m” files that are fully commented as well as any plots or other work.