

# Homework #5: Phys 3320: Prof. Olness Fall 2016

***Due Thursday 20 October, 2016***

*Hint: Use the sample mathematica file posted on the web page:*

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1,2,3,4) Using Mathematica, follow my example for the 4 functions given and:

- Plot the sample function:
- Compute the Fourier coefficients
- Plot the series with different numbers of terms
- Make a "frequency domain" plot of the coefficients
- Re-write the Exp series as a Trig series
- Verify that they are identical

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5,6,7) By hand, compute the Sin coefficients for

5)  $f(x)=x$

6)  $f(x)=0$  for  $x=[0,\pi/2]$  and  $f(x)=1$  for  $x=[\pi/2,\pi]$

7)  $f(x) = \text{Exp}[-x^2]$

on the interval  $x=[0,2\pi]$ .