Homework #3: Phys 4321/7305 Prof. Olness Spring 2026

Due Wednesday 4 February

[Note, there will NOT be 8pm office hours on 4 February.]

1) Fourier Series:

a) Working on the Interval [0, 2 π], using exponentials, compute the Fourier coefficients of the step function: f= 1 for [0, π], and f=1 for [π,2π].

b) compute the Sin and Cos coefficients.

c) Plot the Fourier expansion of Sin+Cos with {1,3,5, 10, 100} terms.
d) Repeat with just the Sin terms.
e) Repeat with just the Cos terms.

2) Fourier Series:
Repeat #3 for a sawtooth function: f[x]= x for [0, 2 π] periodic.