



1 Fourier Series of a Triangle Wave

Originally part of HW 4a

Consider the following triangle wave:

- Find the Fourier series for a triangle wave (such as the one shown in the figure), which has amplitude A and period T .
- Plot several approximations to your solution including the first nonzero term and the first four nonzero terms.
- Make a histogram of your coefficients, i.e. find the spectrum.

2 Fourier Series for the Ground State of a Particle-in-a-Box.

None Treat the ground state of a quantum particle-in-a-box as a periodic function.

- Set up the integrals for the Fourier series for this state.
- Which terms will have the largest coefficients? Explain briefly.
- Are there any coefficients that you know will be zero? Explain briefly.
- Using the technology of your choice or by hand, calculate the four largest coefficients. With screen shots or otherwise, show your work.
- Using the technology of your choice, plot the ground state and your approximation on the same axes.