

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

Treat the ground state of a quantum particle-in-a-box as a periodic function.

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