

P4820 Midterm Two Study List  
Winter 2019

Delta functions: delta sequence, sifting property, derivative of  $\delta$ , delta function of a function, describing physical quantities with (ie. a sheet of charge or mass) in various coordinate systems, integral of, use of series representation (connects with Fourier series).

Distributions: test function, core function, weak convergence, smudging theorem, properties (linearity etc.), derivative of.

Sturm-Liouville Theory: separation of variables, boundary conditions, eigenfunctions, eigenvalues, be able to do a simple S-L problem (only worry about cartesian coordinates for now).

Question 1: Sturm-Liouville problem. Four parts.

Question 2: General properties of distributions, working with distributions. Three parts.

Question 3: Theory of distributions, manipulating distributions, know definitions of test function, core function etc. Three parts.

Question 4: Describing a physical quantity with delta functions (and step functions). Three parts.