

Math 322 (Smith): Problem Set 10

Due Wednesday Dec. 7, 2016

1-4) For the following problems, determine a representation of the solution in terms of a symmetric Green's function. Use appropriate homogeneous boundary conditions for the Green's function. Show that the boundary terms can also be understood using homogeneous solutions of the differential equation.

$$\frac{d^2u}{dx^2} = f(x), \quad 0 < x < 1, \quad u(0) = A, \quad \frac{du}{dx}(1) = B \quad (1)$$

$$\frac{d^2u}{dx^2} + u = f(x), \quad 0 < x < L, \quad u(0) = A, \quad u(L) = B, \quad L \neq n\pi \quad (2)$$

$$\frac{d^2u}{dx^2} = f(x), \quad 0 < x < L, \quad u(0) = A, \quad \frac{du}{dx}(L) + hu(L) = 0 \quad (3)$$

$$\frac{d^2u}{dx^2} + 2\frac{du}{dx} + u = f(x), \quad 0 < x < 1, \quad u(0) = 0, \quad u(1) = 1 \quad (4)$$