Math 319 - Differential Equations II
Pre-Reading Assignment # 3
due 10am Thu Sep 18th, via email

Reading Class notes from Sep 11th. Doing the problems in Assignment #2 is also helpful.

Questions Answer the question below to the best of your ability. It is a very short question, and shouldn't take you more than about half a page to complete.

1. Consider the parabolic PDE ((vibrating string or heat equation)

$$\frac{\partial u}{\partial t} = c^2 \frac{\partial^2 u}{\partial x^2} \tag{1}$$

   with boundary conditions

$$\frac{\partial u}{\partial x}(0, t) = \frac{\partial u}{\partial x}(L, t) = 0, \text{ for } t > 0, \tag{2}$$

   and initial condition

$$u(x, 0) = f(x), \text{ for } 0 \leq x \leq L. \tag{3}$$

   (a) What is the BVP (that is, the x-dependent ODE and boundary conditions) that you arrive at by applying separation of variables to (1) and (2)?

   (b) How is the BVP you obtained for this problem different from the BVPs we obtained in class on Sep 11th?