Math 309 Quiz 5

November 24, 2015

Problem 1. Assuming that $\lambda > 0$, determine for which values of λ the BVP

$$\begin{cases} \psi'' + \lambda\psi = 0 \\ \psi(0) = 0, \ \psi(L) = 0 \end{cases}$$

has a nontrivial solution. SHOW YOUR WORK!!

Problem 2. Find a solution to the heat equation

$$\begin{cases} u_t - 7u_{xx} = 0, & 0 \le x \le 3, t > 0 \\ u(0, t) = 0, \ u(3, t) = 0, & t > 0 u(x, 0) = \sin(\pi x) \end{cases}$$