

Homework 2

Solve the two-dimensional wave equation

$$\frac{\partial^2 u}{\partial t^2} = 9 \left(\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} \right),$$

on the rectangle $(-2 \leq x \leq 2, 0 \leq y \leq 5)$, with the following boundary conditions

$$\begin{aligned} u(x, 0, t) &= 0, \\ \frac{\partial u}{\partial y}(x, 5, t) &= 0, \\ \frac{\partial u}{\partial x}(-2, y, t) &= 0, \\ \frac{\partial u}{\partial x}(2, y, t) &= 0, \end{aligned}$$

and the initial conditions

$$\begin{aligned} u(x, y, 0) &= g(x, y), \\ \frac{\partial u}{\partial t}(x, y, 0) &= 0. \end{aligned}$$

To be handed in before 5 p.m., April 20.