

Homework 5

Solve the heat equation with source

$$\frac{\partial u}{\partial t} = \frac{\partial^2 u}{\partial x^2} + 4e^{-4t} \cos^3 x,$$

on the interval $0 \leq x \leq \frac{\pi}{2}$ subject to

$$\begin{aligned}\frac{\partial u}{\partial x}(0, t) &= 2, \\ u\left(\frac{\pi}{2}, t\right) &= 0, \\ u(x, 0) &= f(x).\end{aligned}$$

To be handed in before 5 p.m., May 12.