Homework 6

Math 330

due at 5pm on Thursday, November 2, 2023

Solve the following problems and communicate your solutions clearly. Explain your work using complete sentences, and include diagrams as appropriate.

For this homework, you must type your solutions to all of these problems in LaTeX. Plots/graphs may be drawn by hand or using technology and inserted into your LaTeX document. Make sure your solutions are easy to read, in order, and clearly labeled. Upload a single file containing your solutions to the Homework 6 assignment on Moodle.

1. (3 points) Exercise 4.1.11

Assume that heat conductivity κ is constant, so $w(t, x) = -\kappa \frac{\partial u}{\partial x}(t, x)$.

2. (12 points) Exercise 4.2.3 (a), (d), and (f)

3. (5 points) Exercise 4.2.4 (a)

This exercise is asking for all product solutions of the form $u(t, x) = w(t)v(x)$. It is not asking for a series solution.

4. (5 points) Exercise 4.2.5

5. (5 points) Exercise 4.2.16