MATH 462 Section 0201 Fall 2019

Partial Differential Equations

HOMEWORK # 12 (Practice problems for the final exam)

Chapter 1

§1.2: Pbs 7, 10;

§1.3: Pbs 1, 3 and 5.

Chapter 2

§2.1: Pbs 6 and 7;

§2.2: Pb 5; HW4 #1;

§2.3: Pbs 7 and 8;

§2.4: Pbs 15, 16, and 18.

Chapter 3

§3.1: Pbs 2 and 3;

§3.2: Pbs 2 and 3;

§3.3: Pb 2.

Chapter 4

§4.1: Pbs 4 and 6;

§4.2: Pbs 1 and 4;

§4.3: Pb 11.

Chapter 5

§5.1: Pbs 3 and 9;

§5.2: Pbs 4, 5, 6, 10, and 15;

§5.3: Pbs 5 and 10;

§5.4: Pbs 3 and 8;

§5.5; Pb 3 and 5.

Chapter 6

§6.1: Pbs 6, 9, and 10;

§6.2: Pbs 4 and 7;

§6.3: Pbs 1 and 2;

§6.4: Pb 3.

Chapter 8

Pb1. Prove that second order centered differences are second order accurate, namely

$$\frac{u(x_{j-1}) - 2u(x_j) + u(x_{j+1})}{\Delta x^2} - u''(x_j) = C\Delta x^2 u^{(4)}(\xi),$$

and find explicitly the numerical constant C. Hint: use Taylor expansion around $x = x_j$.

§8.2: Pb 11.

§8.4: Pb 3.