

AMSC/CMSC 661 - HW 2

Due February 12 (in class)

Instructions: A solution to at least one problem (of your choice) should be submitted in latex. You may submit the solution to the other problems hand written.

1. What are the types of the following equations

(a) $-3u_{xx} + 2u_{xy} + 4u_y + 5u_{yy} - 3u_{yx} + 4u = 2$

(b) $u_{xx} - 5u_{xy} + 5u_{yy} + 2u_x = 3.$

2. Find the regions in the xy plane where the equation

$$(2 + x)u_{xx} + 2xyu_{xy} - y^2u_{yy} = 0,$$

is elliptic, hyperbolic, or parabolic. Sketch them.

3. Problem 1.4 from the book

4. Problem 1.5 from the book