

MATH 4340 Advanced Engineering Mathematics
HW No.4 (Due: Mar. 5)

1. Determine the region in the xy -plane for which the equation

$$(xy + 1) u_{xx} + (x + 2y) u_{xy} + u_{yy} + xy^2 u = 0$$

is hyperbolic, parabolic, or elliptic.

2. Use separation of variables to find solutions for the partial differential equations.

a. $u_x - u_y - u = 0$

b. $y^2 u_x - x^2 u_y = 0$

c. $x u_{xy} + 2y u = 0$