

Math 3326
Fall Semester 2008
Problem Set #4

1. In each of the following problems, classify the equation as hyperbolic, parabolic, or elliptic (in a region where the coefficients are continuous).

(a) $4u_{xx} + u_{xy} - 2u_{yy} - \cos(xy) = 0$

(b) $u_{xx} + 4xu_{xy} + 7u_{yy} - u_x + u_y = 0$

(c) $yu_{xx} + 4u_{xy} + 4xyu_{yy} - 3u_y + u = 0$

(d) $3u_{xx} + 2yu_{yy} + xu_x - u_y + yu = 0$

(e) $u_{xy} - 2u_{xx} + (x + y)u_{yy} - xyu = 0$

(f) $xu_{xx} - 2u_{xy} + xu_{yy} - x \cos(y) = 0.$