

Math 4315/5315 - PDEs Sample Test 2

Test Date: Fri. Oct. 14, 2005

1. Transform the following PDEs to canonical form. In the case that the type is hyperbolic, transform to both modified and regular form

$$(i) \quad 6u_{xx} - 5u_{xy} + u_{yy} = 0,$$

$$(ii) \quad 4u_{xx} + 12u_{xy} + 13u_{yy} = 0,$$

$$(iii) \quad u_{xx} + 4u_{xy} + 4u_{yy} - u_x = 0,$$

$$(iv) \quad x^2u_{xx} + 2xyu_{xy} + y^2u_{yy} - xu_x - yu_y = 0,$$

$$(v) \quad 2y^2u_{xx} - 5xyu_{xy} + 2x^2u_{yy} = 0,$$

$$(vi) \quad x^2u_{xx} - 2xu_{xy} + 5u_{yy} + xu_x = 0,$$