Math 4315/5315 - PDEs   Sample Test 2

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

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

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

(iii) $\qquad\qquad\qquad\qquad u_{xx} + 4u_{xy} + 4u_{yy} - u_x = 1,$

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

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

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