

Math 4315 - PDEs Home Work 3

1. Solve the following PDEs by the method of characteristics

$$(i) \quad u_x^2 - 3u_y^2 - u = 0, \quad u(x, 0) = x^2$$

$$(ii) \quad u_t + u_x^2 + u = 0, \quad u(x, 0) = x,$$

$$(iii) \quad u_x^2 + u_y^2 = 1, \quad u(x, 1) = \sqrt{x^2 + 1}$$

$$(iv) \quad u_x^2 - u u_y = 0, \quad u(x, y) = 1 \text{ along } y = 1 - x$$

Due: Monday Sept. 29, 2014