

Math 3326  
Fall Semester 2008  
Problem Set #2

1. For each of the following first-order partial differential equations, find
  - (a) the characteristic equation and the characteristic curves, and
  - (b) the general solution (in terms of the variables  $x$  and  $y$ ) :
    - (i)  $3u_x + 5u_y - xyu = 0$
    - (ii)  $u_x + 4u_y - xu = 0$
    - (iii)  $u_x - xu_y = 4$
    - (iv)  $u_x + yu_y + xu = 0$
    - (v)  $xu_x + yu_y + 2 = 0$ .