

## Differential Equations (92.236)

### Homework Assignment #6 Spring 2007

#### *Separable, Linear, and Exact Equations and Substitution Methods*

#### Problem 1

Solve the following first-order ODEs using the variety of techniques discussed in Chapter 1 of your text:

a.  $(x - y)y' = x + y$

b.  $y' = 6e^{2x-y}$  with  $y(0) = 0$

c.  $3y^2y' + y^3 = e^{-x}$

d.  $xyy' = x^2 + 3y^2$

e.  $y' = -\frac{(3x^2 + 2y^2)}{(4xy + 6y^2)}$  (hint: use the exact form)

f.  $y + xy' = 2e^{2x}$

g.  $(x + y)y' = 1$

h.  $y' = -\frac{1 + ye^{xy}}{2y + xe^{xy}}$  with  $y(0) = 0$

i.  $y' - \frac{y}{x} = \sec\left(\frac{y}{x}\right)$

j.  $(x + 1)y' + 2y = 6x$  with  $y(0) = 1$