

**Differential Equations (92.236)**  
**Homework Assignment #5 Spring 2007**  
*Slope Fields and Solution Curves*

**Problem 1**

Generate the slope field for the following ODEs and print out a well-labeled plot for each case. You should use the *sfield.m* function discussed in the Matlab lab session to do this using the ranges for the x and y variables as indicated below (also see *sf\_demo2.m* and *sf\_demo\_eqn.m* as an example):

a.  $y' = \tan(x - y)$       $0 \leq x \leq 10$     and     $-5 \leq y \leq 5$

b.  $y' = x^2 - y^2$       $0 \leq x \leq 2$     and     $-3 \leq y \leq 3$

c.  $y' = 6e^{2x-y}$       $0 \leq x \leq 3$     and     $0 \leq y \leq 6$

d.  $y' + 1 = 2y$       $1 \leq x \leq 5$     and     $-5 \leq y \leq 5$

**Problem 2**

On each plot from Prob. 1, clearly identify the two initial conditions given below for the corresponding ODE, and carefully sketch by hand the approximate unique solution curve for each of the given IVPs:

a.  $y' = \tan(x - y)$       $y(0) = -2$     and     $y(0) = 1$

b.  $y' = x^2 - y^2$       $y(0) = 0$     and     $y(0) = 2$

c.  $y' = 6e^{2x-y}$       $y(0) = 0$     and     $y(0) = 5$

d.  $y' + 1 = 2y$       $y(1) = 0$     and     $y(1) = 1$