MA 266 Spring 2001 HW 4 Handout NAME: ____________________

1. (a) Find the solution of the initial value problem $y' + 2y = e^{-t}, \; y(0) = 1$.

(b) What is the value of the solution at $t = 1$?

(c) What is the smallest value of n for which the Euler Tangent Line Method with n steps gives an approximate value of the solution that is within 0.05 of the actual solution at $t = 1$?

2. (a) Find the solution of the initial value problem
$y' - 2y = -3e^{-t}, \; y(0) = 1$.

(b) What is the value of the solution at $t = 1$?

(c) What is the smallest value of n for which the Euler Tangent Line Method with n steps gives an approximate value of the solution that is within 0.05 of the actual solution at $t = 1$?

3. (a) Use the given direction field of the differential equation $y' + 2y = e^{-t}$ to plot the solutions that satisfy the initial conditions $y(0) = 0.95,\ y(0) = 1,$ and $y(0) = 1.05.$

(b)Use the given direction field of the differential equation $y' - 2y = -3e^{-t}$ to plot the solutions that satisfy the initial conditions $y(0) = 0.95,\ y(0) = 1,$ and $y(0) = 1.05.$

(c) Refer to the plots in (a) and (b) above to briefly explain why more terms were required to obtain the same degree of accuracy using the Euler Tangent Line Method in Problem 2 than in Problem 1.