MATH 2700 - DIFFERENTIAL EQUATIONS, Spring 2008, *Kazancı*

QUIZ 6 2/19/08

Name : SOLUTIONS

1. Solve the following initial value problem.

$$y'' + 2y' - 3y = 0 \qquad y(0) = 3,\ y'(0) = -1$$

$r^2 + 2r - 3 = 0$

$(r+3)(r-1) = 0$

$r_{1,2} = -3,\ 1$

$y(t) = c_1 e^{t} + c_2 e^{-3t}$

$y'(t) = c_1 e^{t} - 3c_2 e^{-3t}$

$y(0) = c_1 + c_2 = 3$

$y'(0) = c_1 - 3c_2 = -1$

$-c_1 - c_2 = -3$

$+$

$0 - 4c_2 = -4 \Rightarrow c_2 = 1$

$c_1 + 1 = 3$

$\Rightarrow c_1 = 2$

$$\boxed{y(t) = 2e^{t} + e^{-3t}}$$