Math 54, Quiz 8 Spring 2007 GSI Carter

Name:

1. Answer the following statement "true" or "false": Let $p_1(t)$, $p_2(t)$, and $p_3(t)$ be continuous on $\mathbb{R}$. Then there is a unique solution on the interval $(-1, 1)$ to the following initial value problem:

$$\begin{aligned} ty''' + p_1(t)y'' + p_2(t)y' + p_3(t)y &= 0 \\ y(0) &= 1 \\ y'(0) &= 0 \\ y''(0) &= 0 \end{aligned}$$

2. Convert each of the following higher-order differential equations into systems of first-order linear differential equations.

   (a) $y'' - 4y' + 3y = 0$

   (b) $y''' + (\sin t)y'' - 4y' + ty = e^t$