

Name:

SOLUTIONS

Quiz #5 - February 18, 2005

1. Solve the initial value problem:

$$y'' - 4y' + 3y = 0, \quad y(0) = 1, \quad y'(0) = 3.$$

$$r^2 - 4r + 3 = 0 \quad (r-3)(r-1) = 0$$

$$y = C_1 e^{3t} + C_2 e^t \quad 1 = C_1 + C_2$$

$$y' = 3C_1 e^{3t} + C_2 e^t \quad 3 = 3C_1 + C_2$$

$$2C_1 = 2$$

$$C_1 = 1 \quad C_2 = 0$$

$$y = e^{3t}$$

2. Let $y_1(t) = \sin(t)$, $y_2(t) = t^2$. Find the Wronskian $W(y_1, y_2)(t)$.

$$\begin{vmatrix} \sin t & t^2 \\ \cos t & 2t \end{vmatrix} = 2t \sin t - t^2 \cos t$$