Name:

This quiz covers: Chapter 7.4 - 7.8 **DUE: Wednesday 5/2** at beginning of class.

Directions: Complete all questions and **show all applicable work.** Partial credit will be given. Please feel free to consult your text, notes and the online direction field solver as you see fit. Please do not discuss with other people (except the professor) or use the internet at large (including Wolfram Alpha).

1.) (Chapter 7.5) Find the solution to the following differential equation and initial condition

$$\mathbf{x}' = \begin{bmatrix} 5 & -4 \\ 2 & -1 \end{bmatrix} \mathbf{x}, \quad \text{where } \mathbf{x}(0) = \begin{bmatrix} -3 \\ -1 \end{bmatrix}.$$

2.) (Chapter 7.6) Find the general solution to the following differential equation:

$$\mathbf{x}' = \begin{bmatrix} 1 & -1 & 0 \\ -6 & 0 & 2 \\ -2 & -1 & 0 \end{bmatrix} \mathbf{x}$$

3.) (Chapter 7.8) Find two solutions to the following differential equation. Show that these two solutions form a fundemental solution (Hint: Wronskian) and then form the general solution to the differential equation.

$$\mathbf{x}' = \begin{bmatrix} 7 & -4 \\ 4 & -1 \end{bmatrix} \mathbf{x}$$