MATH-266
Homework #19 (Section 6.1)
Due 07/04/14 **Name:** _____

The majority of the credit you receive will be based on the completeness and the clarity of your responses. Please use equal signs where appropriate and write solutions with a logical flow. Show your work, and avoid saying things that are untrue, ambiguous, or nonsensical.

1. Solve the IVP:
$$\begin{cases} x_1' = -x_1 + 2, & x_1(0) = -1 \\ x_2' = 5x_2, & x_2(0) = 1 \end{cases}$$

2. Solve each system by solving the equivalent second-order equation.

   (a) $\begin{cases} x' = 8x + y \\ y' = x - 6y \end{cases}$

   (b) $\begin{cases} x' = -4x + 2y \\ y' = x - 2y \end{cases}$

3. Write each of the following as an equivalent system of first-order equations.

   (a) $x'' - 6x' + 9x = 0$

   (b) $x'' + 16x = 0$