Homework #11   Math 527, UNH spring 2015
Due Thursday, April 30 in recitation.

For problems with complex eigenvalues, express your answer in both complex and real-valued form.

Problems 1-5. Find the general solution of the system of equations. Prime notation means differentiation in t, i.e. $x' = dx/dt$. Several of these problems feature eigenvalue problems from problems 7-11 of HW 10.

1. $x' = -x + 2y$
    $y' = -7x + 8y$

2. $x' = 2x + 2y$
    $y' = x + 3y$

3. $x' = -x + 2y$
    $y' = -5x + y$

4. $x' = 4x + 5y$
    $y' = -2x + 6y$

5. $x' = -8x - y$
    $y' = 16x$

Problem 6. Solve the initial value problem.

$$x' = x/2$$
$$y' = x + y/2$$
$$x(0) = 3, \ y(0) = 5.$$

Problem 7. Find the general solution.

$$x' = 2x + 4y + 4z$$
$$y' = -x - 2y$$
$$z' = -x - 2z$$

Most problems adapted from Section 8.2 and Appendix II of Zill's "First Course in Differential Equations," 9th edition.