Math 3301 **Homework Set 4** **10 Points**

Real, Distinct Roots

1. Find the general solution to : $5y'' + 2y' - y = 0$.

2. Solve the following IVP.

$$4y'' - 9y = 0 \qquad y(0) = 6, \quad y'(0) = -4$$

3. Solve the following IVP.

$$6y'' + y' - 7y = 0 \qquad y(0) = -2, \quad y'(0) = 1$$

4. Solve the following IVP in terms of β and determine the value of β for which the solution will stay finite at $t \to \infty$.

$$y'' + 2y' - 15y = 0 \qquad y(0) = \beta^2, \quad y'(0) = \beta - 3$$

Complex Roots

5. Solve the following IVP.

$$16y'' + 64y' + 65y = 0 \qquad y(4\pi) = 0, \quad y'(4\pi) = -7$$

6. Solve the following IVP.

$$y'' - 6y' + 11y = 0 \qquad y(0) = 3, \quad y'(0) = 0$$

Double Roots

7. Solve the following IVP.

$$y'' + 10y' + 25y = 0 \qquad y(0) = 6, \quad y'(0) = -10$$

8. Solve the following IVP.

$$4y'' - 28y' + 49y = 0 \qquad y(4) = 1, \quad y'(4) = -4$$