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

Real, Distinct Roots

1. Find the general solution to : $5y'' - y' - 3y = 0$.

2. Solve the following IVP

$$6y'' + 11y' + 3y = 0 \qquad y(0) = 0, \quad y'(0) = -1$$

3. Solve the following IVP.

$$y'' - 16y = 0 \qquad y(0) = 2, \quad y'(0) = -14$$

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

$$y'' - 7y' - 18y = 0 \qquad y(0) = 3 + \beta, \quad y'(0) = 1 - \beta^2$$

Complex Roots

5. Solve the following IVP.

$$4y'' - 24y' + 37y = 0 \qquad y(2\pi) = 0, \quad y'(2\pi) = -1$$

6. Solve the following IVP.

$$y'' + 2y' + 50y = 0 \qquad y(0) = 9, \quad y'(0) = -2$$

Double Roots

7. Solve the following IVP.

$$y'' + 2\sqrt{3}\,y' + 3y = 0 \qquad y(0) = -7, \quad y'(0) = 0$$

8. Solve the following IVP.

$$16y'' - 24y' + 9y = 0 \qquad y(1) = 1, \quad y'(1) = 2$$