NAME **DIFFERENTIAL EQUATIONS** **Test 2A**

4 problems- 25 points each **Show all work for full credit!**

1 (15 points) Compute the Wronskian for the set of three functions

$$\{1, e^{Ax}, e^{Bx}\}$$

where *A* and *B* are constants.

(10 points) Determine the conditions on the constants *A* and *B* that will make the set linearly independent.

2 Use the characteristic polynomial to solve the differential equation:

$$y'' - iy' + 12y = 0$$

Note: coefficient is a complex constant. Also, (5 points) show $y = e^{4ix}$ is a solution by substituting into the differential equation. (Note: this problem has nothing to do with complex conjugates, that applies only if the coefficients are real.)

3 Solve using the method of undetermined coefficients:

$$y'' - y' - 2y = e^{3x} \sin 2x$$

4 Solve using variation of parameters:

$$y'' - 2y' - 8y = 3e^{-2x}$$