

Name \_\_\_\_\_

1. Compute  $(3 - 3i)^4$  by converting to exponential form. (Express your answer in the form  $\lambda + \mu i$ .)

2. Find the general solution to each of the following:

a)  $y'' + 10y' + 21y = 0$

b)  $y'' - 3y' + 4y = 0$

3. Find the solution to the initial value problem:  $y'' - 8y' + 16y = 0$  ;  $y(0) = 2$ ,  $y'(0) = 1$  .

4. Solve the following by the method of undetermined coefficients:

a)  $y'' - y' - 2y = 4x^2$

b)  $y'' - y = 5 \cos \sqrt{2} x$

5. Solve the following initial value problem:  $y' - 5y = 3e^x - 2x + 1$  ;  $y(0) = 1$ ,  $y'(0) = 1$ .

6. Given that  $y_1(t) = e^t$  is a solution of  $ty'' - (2t + 1)y' + (t + 1)y = 0$ . Find a general solution and calculate the Wronskian of the component solutions.