

Quiz #9 MATH 54, Fall 2016, Section 224

Name: \_\_\_\_\_

Section: \_\_\_\_\_

1. Find the solution to the initial value problem

$$y'' - 6y' + 9y = 0, \quad y(0) = 1, \quad y'(0) = 2$$

Aux eq<sup>n</sup>:  $r^2 - 6r + 9 = (r-3)^2 = 0 \Rightarrow$   
Genl Soln  $c_1 e^{3t} + c_2 t e^{3t}$

$$y(0) = c_1 = 1, \quad y'(0) = 3c_1 + 3c_2 = 2 \Rightarrow$$

$$c_2 = -\frac{1}{3}$$

$$e^{3t} - \frac{1}{3}te^{3t}$$

2. Find the general solution to the following differential equation:

$$y'' + 4y' + 6y = 0$$

Aux eq<sup>n</sup>:  $r^2 + 4r + 6 \Rightarrow r = \frac{-4 \pm \sqrt{16-24}}{2}$   
 $= -2 \pm \sqrt{2}i$

$$\Rightarrow c_1 e^{-2t} \sin(\sqrt{2}t) + c_2 e^{-2t} \cos(\sqrt{2}t).$$