

Quiz #9 MATH 54, Fall 2016, Section 219

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

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

1. Find the solution to the initial value problem

$$y'' - 4y' + 4y = 0, \quad y(0) = 2, \quad y'(0) = 4$$

Aux. eq<sup>n</sup>:  $r^2 - 4r + 4 = (-2)^2 = 0 \Rightarrow$

gen<sup>l</sup> sol<sup>b</sup>:  $c_1 e^{2t} + c_2 t e^{2t}$

$$y(0) = c_1 = 2$$

$$\boxed{y = 2e^{2t}}$$

$$y'(0) = 2c_1 + 2c_2 = 4 \Rightarrow c_2 = 0$$

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

$$y'' + 2y' + 2y = 0$$

Aux. eq<sup>n</sup>:  $r^2 + 2r + 2 \Rightarrow r = \frac{-2 \pm \sqrt{4-8}}{2}$

$$= -1 \pm i$$

$\Rightarrow$  Gen<sup>l</sup> Sol<sup>b</sup>:  $c_1 e^{-t} \sin t + c_2 e^{-t} \cos t$