

QUIZ 5 - MATH 310

Thursday, October 3

YOUR NAME: \_\_\_\_\_

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Read each problem **very carefully** before starting to solve it and do only what is asked. Each problem is worth around 5 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. [6 points] Solve the initial value problem

$$4y'' - 16y' + 17y = 0, \quad y(0) = \frac{3}{4}, \quad y'(0) = 4.$$

2. [6 points] Consider the differential equation

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

(a) Without using the characteristic equation, verify that  $y_1(t) = e^{-t}$  is a solution.

(b) Use the method of reduction of order to find a second solution  $y_2(t)$ .

(c) Use the Wronskian to show that  $\{y_1, y_2\}$  is a fundamental set of solutions.