

QUIZ 4 - MATH 310

Thursday, September 26

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

$$2y'' - 9y' - 5y = 0, \quad y(0) = 5, \quad y'(0) = -19.$$

2. [6 points] Consider the differential equation

$$y'' + p(t)y' + q(t) = 0.$$

Assume that we know that

$$y_1(t) = e^{-5t} \sin(3t), \quad y_2(t) = e^{-5t} \cos(3t),$$

are solutions.

(a) Compute carefully the derivatives  $y_1'(t)$  and  $y_2'(t)$ .

(b) Show, using  $W(y_1, y_2)(t)$ , that  $\{y_1(t), y_2(t)\}$  form a set of fundamental solutions of the differential equation.