QUIZ 4 - MATH 310 Friday, September 26

YOUR NAME:_____ George Voutsadakis

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

1. Consider the initial value problem

$$y'' - 4y' - 5y = 0, \quad y(0) = 10, \quad y'(0) = 30.$$

   (a) Find the general solution of the differential equation.

   (b) Solve the given initial value problem.

2. Consider the initial value problem

$$(t^2 + t - 2)y'' + y' = t^3 + t^2 - 2t, \quad y(0) = 5, \quad y'(0) = -3.$$

   Find the largest interval on which the Existence-Uniqueness Theorem guarantees that the given initial value problem has a unique solution, providing all **required explanations**.