Math 321 Quiz 3 Name:

Solve the differential equation

$$y'' - y = 2e^x, \qquad y(0) = 10, y'(0) = 9$$

by performing the following steps:

1. Verify that $y_p = xe^x$ is a solution to $y'' - y = 2e^x$.

2. Find two linearly independent solutions to $y'' - y = 0$ using the method of constant coefficients, then set $y_c = \alpha_1 y_1 + \alpha_2 y_2$.

3. The general solution to $y'' - y = 2e^x$ is

$$y = y_p + y_c = xe^x + \alpha_1 y_1 + \alpha_2 y_2.$$

Determine α_1 and α_2 using the initial conditions.