

YOUR NAME: _____

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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. Solve of the initial value problem

$$y'' + 4y' + 5y = 0, \quad y(0) = 1, y'(0) = 0.$$

2. Solve the initial value problem

$$16y'' + 24y' + 9y = 0, \quad y(0) = 1, y'(0) = 1.$$

3. Use the method of **reduction of order** to find a second independent solution of the differential equation

$$t^2 y'' + 3ty' + y = 0, \quad t > 0,$$

given that $y_1(t) = t^{-1}$ is a solution.