Math 240 - Assignment 6

Name _____

February 29, 2024

Score _____

Show all work to receive full credit. Supply explanations when necessary. This assignment is due March 7.

1. Solve the initial value problem: $y'' - 5y' + 4y = 2e^{4x} \quad y(0) = 1,\ y'(0) = -1$

2. Consider the following equation:

$$y'' - 10y' + 25y = 5x^2e^{5x}.$$

   Solve the corresponding homogeneous equation. Then use your table to find the appropriate form of the particular solution for the nonhomogeneous equation. Do not solve for the undetermined coefficients.

3. Consider the following equation:

$$y'' + 4y = x\cos x + \cos 2x.$$

   Solve the corresponding homogeneous equation. Then find the appropriate form of the particular solution for the nonhomogeneous equation. Do not solve for the undetermined coefficients.

4. Solve the initial value problem: $y^{(3)} + y'' = x + e^{-x} \quad y(0) = 1,\ y'(0) = 0,\ y''(0) = 1$

5. Use variation of parameters to solve $y'' - 2y' - 8y = 3e^{-2x}$.

6. Use variation of parameters to solve the following differential equation.

$$x'' - 4x' + 4x = \frac{e^{2t}}{t^2}, \quad t > 0$$