

Differential Equations
Homework 9
Due April 10, 2024, 9:59 am

Note:

- Please show all of your work (writing a list of answers is not sufficient).
- Please indicate the people you worked with.
- **Please staple your HW.**
- Several random problems will be graded (1 point each).

1. Find a general solution of

(a)

$$y'' + 16y = e^{3x}$$

(b)

$$y'' - y' - 2y = 3x + 4$$

(c)

$$y'' - y' - 6y = 2 \sin(3x)$$

(d)

$$y'' + 2y' - 3y = 1 + xe^x$$

(e)

$$y'' + 9y = 2 \cos(3x) + 3 \sin(3x)$$

2. Set up the appropriate form of a particular solution y_p , but do not determine the value of coefficients

(a)

$$y'' - 2y' + 2y = e^x \sin(x)$$

(b)

$$y^{(4)} + 5y'' + 4y = \sin(x) + \cos(2x)$$

3. Solve the initial value problem

(a)

$$y'' + 4y = 2x, \quad y(0) = 1, y'(0) = 2$$

(b)

$$y'' + 9y = \sin(2x), \quad y(0) = 1, y'(0) = 0$$