

系級：_____ 學號：_____ 姓名：_____

1. 試解：

(1) $y'' + 9y = 3 + 2e^x + \sin x$

(2) $y''' - 4y'' - 7y' + 10y = 3x - e^x$

(3) $y'' + 2y' + y = 3e^{-x}$

2. 試解： $y'' - 3y' + 2y = 3e^{2x} + 2x^2 - 7$ & $y(0) = 1, y'(0) = 0$

3. 試以參數變異法求解

(1) $y'' + 16y = \cos 4x$

(2) $y'' + 2y' + y = e^{-x} \cdot \ln x$

參考解答：

1. (1) $y(x) = c_1 \cos 3x + c_2 \sin 3x + \frac{1}{3} + \frac{1}{5}e^x + \frac{1}{8}\sin x$

(2) $y(x) = (c_1e^x + c_2e^{-2x} + c_3e^{5x}) + (\frac{3}{10}x + \frac{21}{100}) + \frac{1}{12}xe^x$

(3) $y(x) = c_1e^{-x} + c_2x \cdot e^{-x} + \frac{3}{2}x^2e^{-x}$

2. $y(x) = 8e^x - 7e^{2x} + 3x \cdot e^{2x} + x^2 + 3x$

3. (1) $y(x) = c_1 \cos 4x + c_2 \sin 4x + \frac{1}{8}x \cos 4x$

(2) $y(x) = c_1e^{-x} + c_2xe^{-x} + \frac{1}{2}x^2e^{-x} \ln x - \frac{3}{4}x^2e^{-x}$